An Interview with the Author by Bill Bergstrom

(President - VettedMedia and former White House Political Appointee)

In April of 2017, I had the unique opportunity to meet Jaiqi Hu. The dinner was set up by a business associate of mine who suggested that we discuss working together on medical tourism platforms.

I asked him about his background and quickly learned that not only was Mr. Hu an accomplished architect but he was also the creator of a massive online search engine in Asia. We scheduled some time to tour his offices whereby I met hundreds of his employees. I saw for myself that Mr. Hu's creativity and organization that led him to develop so many award-winning projects that helped transform China was now taking place online as he was developing an engaging platform for world-wide commerce.

Having a background in political campaign management and public relations, I have always been drawn to humble but impactful private sector individuals who are motivated to help their communities and the world around them. So, when we began discussing Mr. Hu's research and theories pertaining to common threats that every citizen in every country face, I was intrigued with his analysis because his background and recent experience provided him a unique perspective.

This material is important and it is critical that we listen to the voices of knowledgeable and impactful leaders like Jiaqi Hu. The analysis and review of threats is thorough but among the biggest takeaways for readers is the understanding of mankind's arc of emotional and intellectual evolution. Recognizing our civilization's current inability to really know the ramifications of our advancements risks our capability in managing their impacts. As a result, we may be creating bigger threats to our own existence on a daily basis.

Is our present civilization constructed to work together in order to provide a general quality of life and ensure safety? That question remains as general regions of the globe become uninhabitable, artificial intelligence becomes uncontrollable and world organizations fail to function with efficiency and purpose.

This interview below will help provide you some context to both the author and material. The video content will be made available on line at http://www.hujiaqi.com **and as you read and think about some of these critical issues yourself.**

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Interview with the Author

INTERVIEW WITH THE AUTHOR, JIAQI HU

1. You have studies human issues for almost 40 years. What motivates you to never give up?

When I was in my primary and middle school, it was in the cultural revolution era in which China's education system was brought to a virtual halt. In addition, I grew up in a remote village. As a result, I knew little about science and technology before I went to university in 1979. After that, I suddenly came into contact with a lot of knowledge that I've never contacted before at the university. At that time, I learned that the former Soviet Union detonated a nuclear bomb which released energy approximately equal to 70 million tons of TNT equivalent. In fact, it was possible in terms of both technology and theory to develop nuclear weapon whose TNT equivalent reached hundreds of millions of tons or even greater. That meant power of a bomb was equal to that of total amount of high explosive in a train circling the earth. The destruction was definitely terrible. All these things made me think that if science and technology continued to develop, would humans become extinct one day? I quickly realized that it is an issue worth studying. It doesn't matter if science and technology takes thousands of or tens of thousands of years to get humans extinct. But if it is in the near future? Is there any issue more important than that? I quickly realized the issue is very worthy to be studied and I have studied it for almost 40 years from then. As the research goes on, I've increasingly noticed it is serious, vital and pressing.

2. You think continued development of science and technology will definitely result in human extinction in the near future. What are the bases?

In fact, nuclear weapon is a terrible means of destruction, but it will not cause human extinction. Because nuclear energy is released at one point in explosion of nuclear weapon. Some scientists suggest if all nuclear weapon around the world explodes, nuclear winter, in which billions of people will die, will occur. But someone will survive in the end.

According to scientific theory nowadays, more terrible weapons than nuclear weapons can be developed. For example, biotoxin produced by transgenic technology can target humans' vital organs. It has greater destructive power than nuclear weapon. Another example is AI that attracts our considerable attention at present. If the technology is used to develop intelligent machine for killing people, it will get out of people's control and independently decide which one it will kill. What's more, it is a self-replicating machine. Isn't it terrible? Besides, AI will create consciousness similar to humans sooner or later. That is to say, it will eventually have thinking ability like humans. The machine, with thinking ability of humans, whose response speed is tens of thousands even hundreds of millions of times faster than that of our brains, so it has much greater ability to handle complicated problems than humans. As we know, the higher organism will look down on the lower organism. Even the higher will regard the lower as its food. It will be absolutely impossible for humans to control AI once it really reaches this stage. At present, further development of lots of science and technology, according to the theory, will possibly cause human extinction. However, more terrible is the fact that humans put great enthusiasm in the development of science and technology just from the industrial revolution over 200 years ago. Humans have developed science and technology from very low level to so incredible level in over 200 years. We have many 200 years. Thus, it will not take long time for science and technology to get humans

extinct according to simple reasoning. My conclusion: Science and technology will get humans extinct in 200 to 300 years or even in this century.

3. If science and technology really have the potential to extinct humans, what should we do?
Continued development of science and technology will definitely get humans extinct soon, which is my first conclusion. The conclusion also tells us that if we want to avoid human extinction, we must limit the development of science and technology. The logic is very simple. Now that continued development of science and technology will definitely get humans extinct soon, we must strictly limit the development of science and technology if we want to avoid human extinction.

4. Science and technology is necessary for everything about us. Does your opinion completely negate science and technology?
Absolutely not. Science and technology is a double-edged sword. Sometimes it can benefit humans; sometime it can destroy humans. When the power that benefits humans gets great, the power that destroys humans will gets great, too. What worries me is its limitless development will get humans extinct and eventually make humans completely disappear. I say that we must strictly limit development of science and technology, because it must be so as a whole. But for the achievements of science and technology which are definitely safe and mature, we help them spread over the world instead of limiting its development. Because, without science and technology, it's difficult for humans not only to do lots of things but to survive as well.

5. So what should we do to limit the development of science and technology?
I don't think it's possible in this society. For humans, present social formation is country-based society. The highest power is the country in the society. Countries compete for various benefit. Competition between countries always results in the war where people will die. Both economic and military competition is in essence science and technology competition because Science and technology are primary productive forces. Thus, any country, for its survival and development, will not limit the development of science and technology for humans benefits. This is because the country will perish once it fails in the competition. I think only when human unification is realized can the power of world government achieve the goal of strictly limiting the development of science and technology. Because there is competitive relationship between countries, while world government is shared by the world. World government considers and handles the issue from the perspective of humans.

6. Humans has always been in separate governance. Is it possible to realize human unification?
It now seems very difficult to realize human unification because it will affect many people's benefits. But we can presume that whether we can unify to fight with aliens when they invade. When aliens invade, they are our common enemies. If we don't unify, we'll be destroyed. In fact, we are facing a huge threat of being completely destroyed. This threat is that the development of science and technology will get humans extinct soon. Why is it very difficult to realize human unification? Because the threat has not been generally recognized yet. The development of science and technology will definitely get humans extinct soon. If we can spread the idea over the world

and help everyone truly realize humans will have future only by unifying to limit the development of science and technology. If we don't unify to limit the development of science and technology, humans will be completely destroyed. When the idea is widely accepted, human unification will be promising.

7. Even if human beings have achieved unification, how to guarantee that in the long term human division and the crazy development of science and technology will not happen one day in the changeable society?

This is a very good question, it's also the most difficult problem we face. In my research, my answer to this question is as follows: We must impose strict restrictions on science and technology if human beings can achieve unification. This is only one aspect, the other more important aspect is to seal up permanently the advanced science and technology that may be harmful to humans and eventually forget, especially the scientific theory. Even if human society may be divided, science and technology are developed again after that, it still takes a longer time to reach a certain stage. When humans awaken again to impose strict restrictions and seal up technology, it may result that science and technology cannot reach the stage that can get humans extinct. There are a series of designs for the future society in my research. For example, our future society should be peaceful and friendly instead of today's highly competitive society. A non-competitive society is not only beneficial to the realization of the people's happiness, but also could restrain the dizzying development of science and technology. I also make corresponding designs for the various systems including political system in the future. I divide the various political systems into two types: One is a centralized system, the other is a decentralized one. It's hard to say which one is better. For instance, the benefits of a decentralized system is its checks and balances of powers. Rights will not be in an unconstrained expansion. Its replacement is also comparatively scientific. Its institutional policy execution and continuity of policy still need to be improved. While, the benefits of a centralized system is its strong enforcement and good continuity of the policy. Over-centralized rights may result in dictatorship, governor's absurd and irrational behavior, which is difficult to stop. I also make a design of the political system in the future society. I think I can combine the advantages of the two systems according to my design. In this way, our future society can safeguard not only checks and balances, smooth transition of powers, but also its strong enforcement and good continuity of the policy. I think this designs are beneficial to long term stability of the future society and long term unification of the human world.

8. Who do you think who can play the biggest role in saving humanity?

Saving humanity is a big event of mankind, we have to rely on ourselves. I think the most capable people are countries' leaders. Therefore, I have written to big countries' leaders like China, the United States of America and Russia for many times to appeal. As a scholar, what I can do is to spread my research results.

9. You said you have encountered incomprehension and many obstructions when you study on human issue these years. Isn't that a contradiction because your company studies science and technology as well?

My book Saving humanity was published over a decade years ago. After only 2 days, it was asked to stop publishing. In these years, I have delivered speeches in schools and institutions, published

many articles. I have written to many national leaders, influential research institutions and scholars expressing my points, but few people agrees with me. As a matter of fact, there is no much time for humans. Every step we take today is pushing humans to the abyss of extinction, which is why I'm so anxious.

Science and technology has achieved rapid development in past over 10 years. Especially the recent achievements like AI make many scientists realize the extinction problems might brought by this technology. Some scientists even called for rational development of AI, but these people are a minority. People don't realize that it is not a certain technology that gets themselves extinct, but the continued development will certainly make themselves extinct. Without AI, there will be other technologies that will get humans extinct. It is time for us to make actions.

The last thing I want to say is bigger companies conduct scientific and technological research in their own fields. Even if my company does not conduct scientific research, other companies will also do it. If our company can go further in science and technology, we will give a hand when humans encounter unexpected incidents in the future.

Second Edition Preface Revised Hawking Raised Three Views Identical to Mine

Second Edition Preface Revised

Hawking Raised Three Views Identical to Mine

Today marks the eleven-year publication anniversary for the first edition of my book Saving Humanity. In these eleven years, science and technology has developed rapidly, and human society has changed drastically as well.

Thinking back eleven (should be eleven as well to keep with the timeline) years to when Saving Humanity was first published, almost no one concurred with all my core views, and even those who agreed with one core view were few and far between. However, in the short span of eleven years-a mere second in human history-the development of science and technology has greatly changed the way the world is perceived. Some of my predictions back then are becoming reality today, and some well-known scientists and scholars have come up with views similar and even identical to my own.

I chose "Hawking Raised Three Views Identical to Mine" as the preface title for the second edition of Saving Humanity, in order to use Stephen Hawking-the most famous physicist today- to illustrate my points. In reality, many scientists have proposed ideas similar to mine in the past eleven years, using Hawking as the example is due solely to his fame.

Stating that "Hawking Raised Three Views Identical to Mine" is obviously to demonstrate the importance of my research using Hawking's reputation, that I do not deny. The reason I say, "Hawking Raised Three Views Identical to Mine" and not vice versa, is because my views existed first and Hawking's came later, and because I proposed my views much earlier than he did. These three viewpoints are all clearly elaborated in the first edition of Saving Humanity published in 2007.

The first point: in April 2010, Hawking stated that aliens almost certainly exist, that we should avoid them and never attempt to contact them. Contacting aliens would likely result in the destruction of humanity as human beings cannot defeat aliens. Hawking's reasoning and examples are exactly the same as mine, yet three years later.

The second point: In December 2014, Hawking pointed out that artificial intelligence will eventually develop self-consciousness and replace human beings, since technology develops at a greater speed than biological evolution. Once artificial intelligence completes its development,

they may cause humanity's extinction. Hawking's reasoning and examples are basically my own, but seven years later.

The third point: in March of this year (that is, 2017), in an interview with the London Times, Hawking observed that without proper control, artificial intelligence was likely to destroy humanity. He reasoned that we must identify these kinds of threats faster and take action before losing control, in order to do so, some type of world government must be established. Once again, Hawking's reasoning and examples echo mine, this time a decade later than me.

The above viewpoints are certainly not borrowed from Hawking, more likely he referenced me. Not only because my ideas came before his, but also because my related works and articles have been sent to many national leaders and a number of institutions. The electronic version has been published in both Chinese and English on multiple sites, not only in China but on scientific, social and political websites in the United States, Britain and many other countries as well.

What I am trying to say is that the world's top scientists are starting to agree with my core views, and these core views are essential to the continued survival of humanity. Striving for the rest of the world to accept these views and take appropriate action is vitally important. Simultaneously, I believe that Hawking's views are still not deep enough, not comprehensive enough and not thorough enough.

In 1979, shortly after I started college, a strange idea occurred to me. Science and technology is a double-edged sword that has the potential to both benefit and destroy mankind, then if science and technology continued to develop at its continued rate, could it eventually drive humanity to extinction? The possibility of human destruction through technology in the near future is undoubtedly a huge deal, so is a solution to this problem possible? I quickly realized that this was a worthwhile subject—one of those rare things worth dedicating one's life to. I soon decided that this would be the only cause of my life. I left my government job to pursue business in order to better fund the research for this cause, and to provide better conditions to promote and further my study.

A few decades have gone by, and now this cause is no longer merely a career for me, but more of a responsibility and mission. That is because my research has yielded truly terrifying results—that humanity's development has taken a fundamentally erroneous turn, one disastrous enough to end mankind and push us into extinction once and for all.

It is very challenging to fully prove that science and technology will destroy humanity and to find a solution to this crisis—it took me nearly twenty-eight years. I finished my book "Saving Humanity" in January of 2007. When this 800,000-word work was still a sample book, I delivered it to 26 world leaders, among them include the Chinese president, the president of the United States and the UN secretary. Apart from one phone call from the Iranian Embassy, I did not receive any feedback.

In July of 2007, "Saving Humanity" was published in 2 Volumes by Tong Xin publications, but was asked to stop issuance after just one day.

I later published the book "The Greatest Question", and two other books "On Human Extinction" and "Saving Humanity (Selected Works)" in Hong Kong, as well as numerous articles. I also put both the Chinese and English versions of my articles and "Saving Humanity (Selected Works)" online. A website was specifically built for this purpose, under the name "Hu Jiaqi Website". In order to promote my views and suggestions, I wrote numerous letters to the leaders of major world

powers, the UN secretary and other relevant agencies. In addition, I have also lectured at many universities and research institutions.

Over the years I have exchanged opinions with many people, but my core views are often considered unfounded, while some people directly accuse me of fallacy.

Although I am pleased that many scientists and scholars today have offered up views similar to mine, it is still regrettable that my core views have not been seconded nor recognized by any major players. I am deeply anxious about this, since humanity truly does not have much time left.

Through these many years of research, I have formed a few core views and a series of secondary views. In the second edition preface of "Saving Humanity", I will only discuss my three core views which entertain practical significance, the other core views will be further discussed in the book. My first point of practical significance is this: the continued development of science and technology will soon destroy humanity—at best in two or three hundred years and at worst by the end of this century, I believe the latter to be more likely.

Similar views have been broached by others. In May 2013, Oxford University's future of humanity institute—located in the same city as Hawking—published results stating that humanity could reach extinction.

The president of this research institute Nick Bostrom commented in an interview, "Human's scientific abilities are at war with human's wisdom in using these abilities, I fear that the former may far outreach the latter." (Bostrom's worries are what I call the evolutionary imbalance phenomenon, I published a specific article on this topic.)

Bostrom further elaborated that threats like planetary collisions, super volcanoes, nuclear explosions etc are not enough to impend the survival of humanity. The biggest threat to mankind comes from the "uncertainties" brought on by technological innovations like synthetic biology, nanotechnology, artificial intelligence and other scientific achievements that have not yet emerged.

When I learned that Oxford University's future of humanity institute had come to the same conclusion as I had, I was overjoyed. I immediately wrote a letter addressed "To: Professor Nick Bostrom, Dean of the Future of Humanity Research Center" and an article titled "Finding a common voice". I translated both writings into English and sent them to Nick Bostrom as well as published them online. In order to better get his attention, I specifically used my title "Beijing Mentougou District CPPCC member", but I never received a reply.

In early 2016, the intelligent robot "Alpha Dog" developed by Google defeated South Korean Go master Li Shishi, shocking the world and fully demonstrating that robots possess deep learning ability—a chilling thought upon further pondering. Soon after, some of the world's top scientists such as Hawking, Musk and Bill Gates pointed out that the development of artificial intelligence could be the biggest threat to human survival. The fact is, once artificial intelligence acquires human-level thinking abilities and selfawareness, their response time will be thousands, tens of thousands or even hundreds of millions of times faster than that of humans. The simple rule of evolution tells us that humans cannot hope to control artificial intelligence anymore once they reach such a stage.

In May of 2016, Bill Gates pointed out in the Reddit AMA series, "in a few decades, artificial intelligence will be strong enough to warrant concern… have no idea why some people are completely indifferent to this." This prompted me to consider the study of artificial intelligence within my own company, since so many people are studying it already and I can only keep track

of its movements by researching myself. If humanity really encounters unexpected disaster in the future, maybe I will be able to help in some way.

My second point of practical significance is this: only through human unity, the establishment of a world government and a world regime can we firmly grasp the developmental course of science and technology; i.e. the "World Government" approach Hawking proposed to control artificial intelligence.

The reasoning for the above view is, no country can wholeheartedly control and regulate science technology since countries are in constant competition and any failure could lead to total destruction. With science and technology being a main force in production, the competition between countries is essentially a technology race. Who would sacrifice a national competitive advantage for the overall benefit to mankind?! Even the United Nations could not bring about such change—only the unity of humanity as a whole and the establishment of a world government could accomplish this. A World government considers things on the level of all mankind instead of on a national standpoint, it removes the pressure of individual competition, thus making it possible to regulate world order through the power of an international regime.

My third point of practical significance is also the one that still lacks influential backing, it theorizes that we must strictly limit the development of science and technology in order to prevent the extinction of humanity. Due to the uncertain nature of technology, the more advanced a technology is, the harder it is to control and regulate. Not even the world's top scientists can accurately predict the consequences of scientific discoveries—even Einstein, Newton and Hawking make errors in scientific judgment. Many technological developments have already brought disaster to mankind.

With science and technology already developed to a hazardous height and still continuing its dangerous ascension, the risks are difficult to predict. Distributing and sensibly managing the safe mature scientific achievements we already enjoy on a global level is more than enough to guarantee a comfortable existence for mankind. If we keep up the unchecked demand on technology, human extinction will not be far off. The fact of the matter is, while some high-tech developments may be harmless to humans, not all high-tech developments are. We may be able to control the development and use of certain high-tech developments, but there is no way to control them all. He that touches pitch shall be defiled—accidents are always bound to happen and one big scientific blunder could be the end of humanity. Hawking believes that just controlling artificial intelligence is enough to solve the problem, but we can only control them for a time—is there any guarantee that the control will last forever?! And even if we could control one technological advancement, how could we possible control all of them?! Only by utilizing the World government to rigorously screen and adapt mature, established scientific achievements; permanently seal and eventually forget all other technological advancements as well as strictly limit scientific research, can humans ensure a continued existence. This is precisely where I find Hawking's views lacking in depth and comprehensiveness. Perhaps people will think my ideas to be absurd, but I firmly believe this to be the truth.

What needs to be clarified here is that restricting the development of science and technology is not denying the positive contributions science has made to humanity, but merely a concern that its negative effects could destroy mankind; in other words, this is not calling for just China or the United States to restrict or lead the way in restricting science development, it must be a synonymous global effort.

I'd also like to touch on the issue of aliens, where me and Hawking again share similar views—this is just one of my secondary points.

I believe that aliens definitely exist, as there are hundreds of billions of galaxies in the universe, with each galaxy housing hundreds of millions of stars (we have two or three hundred million stars in the Milky Way). Though only planets orbiting a stellar have the capacity to produce intelligent life forms— so the probability is very small—the overall total capacity is still fairly high.

However, it is extremely difficult for alien life to traverse the interstellar distance and reach earth. The distance between stars is calculated in lightyears, for example, our closest neighbor in the solar system is the Alpha Centauri— which is still 4.25 light years away. Even using the fastest non-manned spacecraft we currently have, it would take tens of thousands of years to arrive, let along manned ones which are substantially more difficult. Moreover, it is pretty much impossible for there to be intelligent life on or near Alpha Cen, since it is a triple star system consisting of three stars orbiting each other. This type of star system is not conducive to the existence of life. That is why we have not found any trace of aliens on earth, even though earth formed 4.6 billion years ago, and the earliest microbial life can be traced back 4.28 billion years.

Conversely, if aliens really did reach earth it could be extremely problematic. Since the universe formed 13.8 billion years ago, intelligent life could have formed four or five billion years earlier. Any aliens who could travel through the interstellar divide and reach earth would be at least thousands, or even hundreds of millions of years ahead of us in terms of scientific development. The laws of nature inform us that more civilized groups despise less civilized groups; higher species kill lower species and even treat them as food to be fried and cooked. Once highly civilized aliens reach earth, our fate would be similar to that of the American Indians or Australian Aboriginals in the face of colonialists—or even worse. Nowadays, some people are keen to communicate with aliens, that is in fact very irrational behavior.

Finally, I believe that humans must rely on themselves to save mankind, and the leaders of major world powers possess the most capacity to do so. As a scholar myself, I can only sound the alarm, which is why I wrote so often to the leaders of powerful nations.

If one takes my three core views to heart, then the conclusion that only a unified front can save humanity is a logical one. Known as "the father of artificial brain" Hugo de Garis believes that artificial intelligence will destroy mankind, yet he also believes that the destruction of lesser species by higher species is a natural course. Thus, the destruction of humanity by artificial intelligence is completely reasonable and the creators of these higher species can be considered deities, or God themself. Let us imagine then, as members of the human species ourselves, can we bear to be destroyed?

While I began editing the second edition of "Saving Humanity", the cinemas were showing the movie "Resident Evil: The Final Chapter". The movie centers around a high-tech company that developed a bio-weapon which could destroy humanity. The company's leaders planned to retain only their own shareholders and destroy the rest of humanity with this weapon. These are obviously the actions of truly deranged immoral people—but with so many high-tech companies around the world, who's to say there aren't such deranged immoral individuals among them?

Chapter One The Past Is Connected to the Now

Nothing exists in isolation. Everything today is a continuation of the past as well as an indication of the future; everything around us is impacted by distant things, and in turn influences other things in the distance. In order to answer questions about mankind and human society, one must first understand humanity and human history itself, as well as the environment in which humans survive.

SECTION ONE: THE PURSUIT OF TRUTH

In the thousands of years of recorded human civilization, truth is often mistaken as fallacy, while fallacies are often regarded as sacred and inviolable truths. The birth of a revolutionary truth must always weather a ruthless and bloody storm of opposition: that has been the universal law throughout time.

Many scientific conclusions have led to tragic persecution and brutal combat in the long course of history, but truth always wins out in the end. Through the endurance of time, fact will always shine through the layers of absurdity and make its brilliance known universally.

The path to truth is often filled with hardship. Three such examples are introduced below.

One: The Story of Earth's Relation to the Universe

Since the beginning of time, humans have been preoccupied with understanding the earth we live on and the universe surrounding it. Due to the limitations of the known world, for thousands of years after entering civilized society, humans could only rely on their intuition and imagination to observe the sun, moon, stars, earth, and sky and attempt an understanding of the earth and universe.

"Geocentric" was a cosmologyical doctrine established in ancient Europe; it was first proposed by the third-century BC ancient Greek philosopher Aristotle. He theorized that the earth was the center of the universe, with the moon, stars, and all cosmic matter orbiting around it. Aristotle was a master of ancient Greek philosophy and a teacher to the famous Macedonian king, Alexander the Great. His lofty status and seemingly reasonable explanation might have been the reason this wrong theory dominated the Western world for more than a thousand years. It is often through a series of "developments," misinterpretations, and accidental applications that falsehoods gain and cement their dominance in the world.

The astronomer Ptolemy further developed and improved upon the geocentric theory. He believed that Earth was located in the center of the universe, with the moon, Mercury, Venus, the sun, Mars, Jupiter, and Saturn ranging around it in successive order. According to him, these planets all orbited the earth within their own trajectory at regular intervals.

All of the above views regarding the earth and its relation to the universe fall within the realm or normal academia. According to the general principles of scientific research, as long as there is sufficient basis, a new correct scientific conclusion can overturn a previous wrong one without much difficulty; however, once a scientific theory is deliberately exploited by the dominant religious or political authorities, the situation becomes much more complicated.

Christian doctrine took up the incorrect geocentric theory. According to Christianity, God created Earth and the universe. The earth was the center of the universe, and everything in the universe, including mankind, was created by God. During the dark medieval times, Christianity firmly imprisoned people's belief systems, not allowing any doubt or rebellion against predetermined Christian ideology. This allowed the geocentric theory to dominate cosmology virtually unchallenged.

The first person to offer substantive challenge to the geocentric theory was Copernicus. Nicholas Copernicus was born in Torun, Poland, on February 19, 1473. He studied law, medicine, and theology at university, but his interests lay in astronomy. In his spare time, Copernicus would observe and study astronomy. Coupled with his reflections on the universe, he proposed the heliocentric theory and dedicated his life to completing the astronomical masterpiece, On the Revolutions of the Heavenly Spheres. This work stated that Earth was not the center of the universe but just an ordinary planet. The center of the universe was the sun, followed by Mercury, Venus, Earth, Mars, Jupiter, and Saturn, in that order.

Today, we can see that Copernicus' argument is not the ultimate truth either, but it was a crucial first step on the path to truth and a complete denial of the geocentric theory. More importantly, the heliocentric theory's denial of geocentric theory would move beyond an astronomical debate to evolve into a challenge of Christian religious theology. The revolutionary consequences inspired by the heliocentric theory would trigger a chain reaction across a series of other fields. This was absolutely unacceptable to the Christian church.

On the Revolutions of the Heavenly Spheres was published after Copernicus had been bedridden by a stroke. With trembling hands, he caressed this masterpiece for which he'd struggled his whole life, and he died not long after.

It was the genius, atheist, Italian philosopher Giordano Bruno who developed Copernicus' theory. Bruno was not an astronomer; he used his own philosophical speculations to propose the idea of an infinite universe, further developing the Copernicus theory. Bruno believed that the sun was not static but constantly moving, and that the sun was not the center of the universe either. He believed that there were an infinite number of worlds outside the solar system, and the universe—being unified, material, and infinite—could not have a center.

Bruno's ideas infuriated the Catholic Church, and the inquisition held a seven-year interrogation against him. Bruno was indomitable and insistent upon the truth, even in prison; he was ultimately sentenced to death by burning. On February 17, 1600, Bruno was burned at the stake in Rome's Campo de' Fiori.

Brutality, bloodshed, and violence can never stop people's pursuit of truth, as evidenced by one of the most outstanding pioneers of modern science: Galileo. Through astronomical observation, Galileo concurred with the Copernicus theory and published the book Dialogue Concerning the Two Chief World Systems in 1632. This book was soon banned by the Roman Catholic Church. Galileo himself was tried in Rome and sentenced to life imprisonment in 1633.

The period in which Bruno and Galileo were sentenced by the church was the darkness before the dawn for Europe. The fourteenth-century Renaissance movement, originating in Italy, sought to organize ancient Greek and Roman works as cultural weapons against religious theology. The movement took up a human-centered humanism ideology to confront the God-centered religious ideology, opening the way for modern ideological liberation.

It was the dedication in the pursuit of truth and fearless sacrifice for righteousness demonstrated by men like Copernicus, Bruno, and Galileo that woke the dawn of the new world. From the seventeenth to the eighteenth century, the Western Enlightenment movement started in Britain and France and expanded to Germany, the Netherlands, and many other countries. The Enlightenment movement used rationalism as an ideological weapon, with its spearhead directly pointed towards feudal autocratic rule and religious theology. It opposed religious superstition in favor of promoting the spirit of science and opposed authoritarian dictatorship in favor of democracy and freedom. The Enlightenment movement even advocated for a rational society free from religion—a secularization of human life. It was the effort of Enlightenment thinkers that uncovered the path to science and reason for all humanity and removed the shackles of religion from the pursuit of truth once and for all. And then there was the American Revolution and the French revolution . . . and so scientific research suddenly saw the light.

It was the power of truth that drove the world to momentous change.

Two: The Story of Earth

The earth is home to man. Our ancestors hunted, gathered, and farmed here day in, day out. It is Earth—the home our survival depends upon—that provides a habitat for humanity within the vastness of the universe. And thus humanity has endured from the beginning of time until today, evolving from apes to Homo sapiens, from barbarism into civilization.

However, the surface of the earth we live on is far from fixed and eternal; it consists of separate plates that constantly drift and change. From the formation of the earth until this day, this surface has undergone much change. About two hundred million years ago, Earth was one supercontinent encompassing all lands. What is today the east coast of South America was connected to the west of Africa; North America was adjoined to the west of the Eurasian continent; Australian was a peninsula off the east of Antarctica; the Indian subcontinent was all the way in Antarctic, thousands of miles away from Southwest China; and China's Tibet was bordered by vast seas.

This was not the first time a supercontinent existed on Earth. Another supercontinent had formed about seven hundred million years ago, but the shapes and locations of the landmasses varied.

The landmasses on Earth have been separating and uniting throughout time. Just as brothers who must go their separate ways once the time comes, this supercontinent finally broke apart, the landmasses starting their separate journeys, two hundred million years ago. The Americas drifted westward, away from Europe and Africa, while the Indian subcontinent broke off from the Antarctic continent and traveled north until it bumped into eastward drifting Asia, forming the magnificent Himalayas in the process. Australia left Antarctica shortly after the Indian subcontinent and traveled north, and it maintains a northward voyage until this day.

Today, the Americas continue to drift westward with the Atlantic Ocean, expanding at a rate of one to four centimeters per year. In fifty million years, the Atlantic will have widened by more than one thousand kilometers. At the same time, the Asian continent is drifting eastward and the Indian Ocean is also enlarging. Under attack on both the east and west side, the Pacific is becoming narrower; eventually, it will no longer be the largest ocean in the world.

As the African continent continues to move north, the Mediterranean will become an inner lake and eventually disappear. The stubborn Indian continent will remain firmly pressed against Asia, causing the Himalayas to rise at a rate of one to five centimeters a year. In some tens of thousands of years, Mount Everest will be more than ten thousand meters in height, further cementing it as the world's highest peak.

After swallowing the Mediterranean, the African continent will continue its "northern expedition," eventually hitting Europe and creating a tall uplift along the African-European continental margin. The Alps will gain in height as well; however, the African continent itself will face large internal divisions. The Great Rift Valley will rupture completely, East Africa will begin an eastward drift, and a new ocean will be produced.

This almost fairytale-esque story is the theory of plate tectonics, which originated from the continental drift theory proposed by German scientist Alfred Wegener. In 1910, when Wegener was lying in bed sick, he was inspired by the world map in front of him. He was fascinated by the similarity of the landmasses on the two sides of the Atlantic, as the protrusion on one side perfectly fit into the concave of the opposite side. With such consistency in shape, could it have been possible that these two continents were once connected? With this idea in mind, Wegener began a series of studies. He not only conducted comparative studies of the continental strata on the two sides of the Atlantic, but he also researched the consistency of African and Brazilian paleontology, eventually producing the theory of continental drift.

Wegener's theory was almost unanimously opposed by geophysicist everywhere. People laughed at his "great poetical dream" and regarded him as an ignorant grandstander lacking basic knowledge of Earth science. Wegener's ideas were deemed to be simply ridiculous and completely unjustified.

Wegener was extremely marginalized and shunned in academia; this exclusion and contempt even affected the small number of people who expressed recognition or sympathy to his theory. During that time in the United States, you could not become a university professor if you subscribed to the theory of continental drift, and you would also face endless irony and disdain. In such an environment, even those who wholeheartedly supported continental drift theory could not express it out loud—this was a rare phenomenon in the United States, where democracy and freedom were such important values.

For a long time, the theory of isostasy held dominance in geology circles. It theorized that the earth's crust moved in an equilibrium of alternating rising and sinking movements that relied mainly on vertical movement and only minimally on horizontal movements. Therefore, the continental drift movement was undoubtedly a fundamental negation of isostasy theory, openly challenging existing geological theories and authorities.

Wegener was alone in his battle; even his famous meteorologist father-inlaw held continental drift theory to be mere caprice. But Wegener persisted in his academic beliefs and was committed to proving continental drift theory in every way possible.

In 1930, the fifty-year-old Wegener met a tragic death in Greenland while attempting to find further evidence to support his theory. The continental drift theory faded into obscurity along with its founder.

It was only in the 1950s that breakthroughs in paleomagnetism research finally validated his theory. When magma goes from hot to cool in its solidification process, it gains magnetism from the earth's magnetic fields. Rocks from different times magnetize in the same direction. Since rocks can be dated, the magnetization direction of rocks across different time periods can also be determined; thus, the different locations of different regions at different times can be determined as well.

In the 1960s, scientists conducted differential research into seabed rocks and terrestrial rocks in conjunction with research into submarine magnetic anomalies, eventually finding evidence of subsea expansion. Wegener's continental theory finally became recognized as truth instead of "absurd heresy." Both Wegener and his theory were vindicated in the academic community. Scientists established the theory of plate tectonics based on Wegener's theory, marking a geological revolution and the advent of a new era in Earth science.

Three: The Story of the Origin of Humanity

When it comes to the origin of humanity, almost every nation has developed its own interpretation over time. Most of these explanations state that humans are created by deities and are accompanied by numerous folktales and legends. When the "God created man" story became a theological doctrine of the prevalent religious power, however, it became uncontestable, as any

challenge to theological doctrine in a religion-centric world could mean imprisonment, or even death.

British naturalist Charles Darwin and biologist Alfred Russel Wallace were both revolutionary figures in the impetus to overthrow the “God created man” ideology. Darwin in particular cast unprecedented doubt on the creation theory through his detailed research and rigorous scientific analysis.

In 1831, the British Navy ship Beagle was set to embark on a scientific investigation of South America. Its main task was to conduct hydrological mapping of the east and west coast and islands of South America, as well as record a time for completing an around-the-world voyage. The ship was missing a naturalist with geophysical knowledge, so Darwin was suggested due to his interest in botany and geology, even though he was not a geologist. This voyage took nearly five years, stopping at many places around the world. While managing geological inspections and collecting data, Darwin discovered many occurrences that contradicted the creation theory.

On the South American Pampas grasslands, Darwin often observed a kind of bird that could not fly, called the rhea. These birds lived in environments similar to that of African ostriches, but although rheas were similar in body structure to ostriches, they were not identical. If God decided to create these beings, wouldn’t one be enough? What point was there in repeating the process?

What struck him as even more odd was his experience while investigating the Galapagos Islands; each island had their own unique creatures. These islands were very close to the South American continent, and the islands’ creatures were obviously different yet still clearly genetically related to the creatures living in South America. Even among the islands, though each island’s creatures were significantly different from each other, they still shared obvious genetic traits. This phenomenon made it possible for people to imagine that such creatures shared the same origin and developed differently in diverse environments—so species were not necessarily immutable. This ideology was undoubtedly incompatible with the “God created all things, and all things are eternal” belief.

Upon arriving in Brazil, Darwin was mesmerized by the variety of plant life, the beautiful leaves and flowers in the Brazilian forests. All this natural splendor dazzled Darwin and caused him to question if God had really created such diverse marvels one by one, all by himself.

After Darwin returned to the Britain, he started thinking in-depth about his voyage and studying domestic animals, ultimately forming the concept of evolution and publishing his far-reaching book, On the Origin of Species, in 1859. In this book, Darwin systematically expounded on his theory of evolution. He believed that all creatures were capable of evolving; some evolutions were heritable, and some were not. Evolution was caused by changes in the living environment and the use of organs; individuals evolved to better suit the environment had better chances of surviving, and organs used more were gradually developed. For example, wild ducks have stronger wings than domesticated ducks because they fly more, while domesticated ducks have stronger legs because they walk more.

Darwin believed that there was a surplus in nature, and that organisms reproduced in far greater numbers than necessary for survival. Only those individuals who evolved to best adapt to the environment survived and produced offspring, while less suitably evolved individuals were eliminated. Under natural conditions, evolution is a need for survival and reproduction. Animals compete for food and mating opportunities, while plants compete for sunshine and nutrients. They are all evolving through such competitions.

In Darwin's mind, a primitive ancestor could produce a variety of species each with their own traits. Different individual hybridizations and isolated geographical environments all contribute to the formation of new species and varied traits. All creatures within the same genus share a genetic connection, just as different foliage on a tree connects to the same trunk.

Shortly after the publication of On the Origin of Species, Darwin's follower, Thomas Henry Huxley, published Man's Place in Nature in 1863. In 1871, Darwin published The Descent of Man, and Selection in Relation to Sex, in which he enumerated many facts to scientifically prove that humans were evolved from animals and shared "kinship" with animals, thus pointing out man's position in nature. Darwin's assertion completely denied the religious doctrine of "God created the world and man." These two books once again caused a sensation. They told people that there was no Creator, that the world evolved according to its own laws, and that species evolved from other species from one common ancestor, producing a variety of complex biological species, including humans.

Darwin and Huxley's arguments caused great waves and infuriated the religious community. One debate on creation versus evolution went down in history. On June 30, 1860, the British Association for the Advancement of Science arranged a debate on creation versus evolution theory. Due to physical discomfort, Darwin did not participate in this debate. Attending on his behalf was staunch Darwinist and quick-thinker Huxley; on the other side of the debate was eloquent Oxford Bishop Wilberforce, a man renowned for his religious attainments. This debate is known in history as the "Oxford Evolution Debate," and it took place in the Oxford University Museum. The sensitive nature of the theme attracted a large volume of listeners; the venue was packed with over seven hundred attendees.

Wilberforce spoke first. Playing on the religious feelings of the people, he carried out a deeply provocative attack: "Mr. Darwin would have us believe that every animal, every reptile, every fish, plant, fly, and fungi descended from the first living creature that could breathe. This is a blatant denial of the will of God. Can we allow such betrayal of orthodox religion?" Wilberforce quickly turned his glance to Huxley and asked, "Mr. Huxley, do you consider yourself descended from an ape through your grandmother or your grandfather?" This clearly humiliating provocation caused the audience to burst into laughter.

After hearing Wilberforce's speech, Huxley quickly realized that Wilberforce did not know what evolution was, nor had he seriously read On the Origin of Species. Huxley calmly stood up after the crowd had quieted and spoke: "I have come to defend science, and I believe that no prejudice can take away the prestige of my respected party." He then plainly explained the fundamentals of

the theory of evolution, pointing out that this was the result of twenty years of observation on Darwin's part, not fabrication, and that it reflected the objective laws of the biological world. Then Huxley said, "On the question of humans originating from monkeys, it is not as superficial and literal as the Bishop understands it to be; it just means that humans are evolved from animals like monkeys." After further illustrating Darwin's views in a more comprehensive manner, Huxley turned his head and started straight at Wilberforce, replying, "[A] man has no reason to be ashamed of having an ape for his grandfather. If there were an ancestor whom I should feel shame in recalling, it would be a MAN, a man of restless and versatile intellect, who, not content with a success in his own sphere of activity, plunges into scientific questions with which he has no real acquaintance, only to obscure them by an aimless rhetoric, and distract the attention of his hearers from the real point at issue by eloquent digressions, and skilled appeals to religious prejudice." The audience responded with warm applause to Huxley's brilliant retort.

The Oxford Evolution Debate had great repercussions. It helped people to clearly understand the absurdity of creationism and the scientific nature of the Darwinian evolution theory. It was evolution that removed the shackles of feudal theology from the field of natural science, allowing it to embark upon a path of independent development. Simultaneously, the theory of evolution further shook the rule of religion through obscurantism, liberating people's minds and defending the dignity of truth.

The pursuit of truth is a demanding process; it requires a certain spirit and a type of courage. Daring to challenge traditional ideas, daring to contest authority, daring to face persecution: these are all premises for the birth of a revolutionary truth.

This book bases its research on the pursuit of truth and the respect for reality. This author is determined to go forth undeterred, with no regrets or fears, because he firmly believes that the conclusions of this book are fundamentally related to the fate and future of humanity.

SECTION TWO: THE BEGINNING OF THE UNIVERSE

One: The Universe Started with "the Big Bang"

Nowadays, any ordinary person knows that the sun we rely on to survive is just another ordinary star in the Milky Way, and that Earth is just another planet of the sun. Before the 1920s, however, the horizon of astronomers was confined to the Milky Way, as if the Milky Way was the entire galaxy. The first person to discover galaxies outside of the Milky Way was American astronomer Edwin Hubble. In 1925, he discovered the Andromeda Galaxy near the Milky Way through astronomical observation, marking the first extragalactic galaxy (i.e., a galaxy outside the Milky Way) observed by humans. In later observations, Hubble found that there were far more than one or two galaxies outside the Milky Way. Ten years after the discovery of the first extragalactic galaxy, the scope of astronomical observation expanded to a range of five hundred million light-years; that is the distance light travels (300,000 km per second) in five hundred million years. At the time, this observation distance seemed to be sufficiently large.

After observing numerous extragalactic galaxies, astronomers discovered that almost all of them were moving away from us, and the further those galaxies were, the faster they were moving away. For example, the Virgo Nebula is moving away from us at a rate of 1,000 kilometers per second; to the astronomers then, this was simply incredible. Why are these galaxies moving away from us? Where does our universe come from, and where is it heading? Many scientists have approached these questions from different perspectives. In 1927, Belgian astronomer Georges Lemaître suggested that all material of the universe could be traced back in time to an originating single point; he called this point the "Cosmic Egg." When the Cosmic Egg suddenly exploded, the explosion material formed the stars. Today, the Big Bang theory of cosmic formation is accepted by most scientists, and this theory is being constantly perfected.

The universe was formed 13.8 billion years ago; of course, this is only a rough estimate. Different scientists have varied understanding of this number, but the differences are not significant.Therefore, it does not prevent our discussion. This time can be confirmed in at least three ways. The first method relies on the observation of galaxy retreat speed. If we rewind 13.8 billion years, the universe can be attributed to one originating point. The second mode focuses on the study of the universe's oldest stars and the star clusters they form. Upon further inference, their ages are all close to 13.8 billion years. These are the first generation of stars formed in the universe. The third approach is centered around the decay of atoms; it uses the law of the atomic half-life to test the age of the oldest existing atoms.

The most common description humans use to describe cosmic origin states that the universe began with a primitive atom. This atom was much smaller than the atoms we refer to today; it had a diameter of only 10^{-33} centimeters, a high temperature, and large density. In specific numbers, this atom has a temperature of 10^{32} K and a density of 10^{93} grams per cubic centimeter. This primitive atom suddenly exploded 13.8 billion years ago. The space it created through that explosion is the universe; the debris it produced are the galaxies, stars, and various substances in the universe today.

However, the above description is not completely accurate. Our cosmology today is based on general relativity and quantum mechanics. Based on today's scientific theory, we can trace the formation of the universe to 10^{-43} seconds after the Big Bang. This period is called the Planck time. The abovementioned figures are the cosmic scale, temperature, and density at this time. Using this state of time as the origin of the universe is actually very arbitrary; since there had to have been a "zero-point" and a singularity point before this time, we are merely unable to describe the universe before Planck time with existing cosmic theory.

It is not easy to truly understand the description of the universe. It first demands that we surrender our observation of the things around us and adopt a completely different way of understanding everything in which we exist and perceive constantly.

From a geometric point of view, a point is zero-dimensional, a line is one dimensional, a surface is two-dimensional, and a cube is three-dimensional. This is something we learn in junior high. We can easily imagine the shape of a point, a line, a surface, or a cube. But space is four-dimensional;

we can perceive it, but we cannot imagine what it looks like. Of course, there will be many people who do not agree with this argument. They might ask: Hasn't time always flowed naturally? Isn't the universe the area we see? People have these doubts because they are confused by their personal experiences. According to existing understandings of cosmic theory, time and space came into existence at the moment of the Big Bang 13.8 billion years ago, and so time has flowed until the present and the universe has been constantly expanding to this day. Surely someone will ask: Even if there was no matter or life before the Big Bang, there must have been time . . . right? The answer is no. Time started with the Big Bang; there was no time before that. If the Big Bang created the galaxies and matter, surely there was empty space before the Big Bang—how else did the debris from the Big Bang disperse? The answer is once again no. Space came into being at the moment of the Big Bang; the volume of space is determined by the volume of the universe's expansion. Someone might ask again: What is outside of the universe? What connects to the edges of the universe? The answer is that the universe only has size; it has no edge and does not touch anything. (There are scientists who believe that there are other universes outside of our universe, but we cannot see them since space is four-dimensional.)

When we observe the galaxy through a telescope, we discover that the further away a galaxy is, the faster it is moving away from us—that is not to say that we are the center of the universe. As a matter of fact, we would reach the same conclusion observing the universe from any planet in any galaxy. Just as when we blow balloons we might observe on any point on the balloon that the further away a point is the faster it is moving away. Observations made on any fixed point give the illusion that the observer is at the center. In reality, every point is just an ordinary point.

The explosion 13.8 billion years created the epoch. At the beginning of the Big Bang, the four natural forces we know today (strong interaction, weak interaction, electromagnetism, and gravitation) were unified. As the universe began to cool and expand, these four forces started to separate. At the same time, the asymmetry between matter and antimatter began to appear; matter outweighed antimatter by a tiny portion. These were the "Dark Ages" of the universe; in this dark space, particles and antiparticles annihilated into photons, producing energy. This annihilation included neutron-antineutron annihilation, proton-antiproton annihilation, electron-positron annihilation, and neutrino-antineutrino annihilation. Today, light fills the entire universe mainly as a product of the early Big Bang period, while the matter that remains from this large annihilation is our cosmic galaxy.

Three minutes after the Big Bang, the temperature of the universe fell to one billion K. During this time, protons and neutrons combined to form nuclei; this process lasted about an hour. When the universe's temperature dropped to one hundred million K, the nuclear synthesis ended. According to theoretical calculations, among the products of the nuclear synthesis, hydrogen accounts for ¾, helium takes up ¼, while tiny amounts of lithium, beryllium, and boron account for less than one millionth of the whole. These theoretical figures have received initial confirmation through astronomical observations today.

During this time, the universe was full of photons, but it was not transparent due to the large number of free electrons also existing in the universe. These electrons blocked the path of photons.

About thirty million years later, the temperature of the universe had dropped to 3,000 K, electron movement was less intense, and it was possible for hydrogen nuclei to capture one electron and turn into hydrogen atoms, for helium nuclei to capture two electrons and form helium atoms, and for lithium nuclei, beryllium nuclei, and boron nuclei to all capture corresponding electrons and form atoms. Without the electrons blocking their paths, photons were liberated and lit up the universe, ending the Dark Age. Concurrently, the universe moved from a radiation-based era to a matter-based era.

In the 1960s, while debugging the radio astronomical telescope, two engineers at the Bell Labs—Arno Penzias and Robert Woodrow Wilson— discovered that a very "cold light" occupied the universe sky. This "light" encompassed every star and every galaxy, filling every corner of the universe. It was not visible with optical telescopes but could only be observed through radio telescopes; its corresponding temperature was 3 K. We know that 0 K is absolute zero, measuring -273 ºC. This is the theoretical minimum temperature, and 3 K is exactly the theoretical calculation of the temperature of waste heat produced by the Big Bang. That cold light that filled the universe is the original light remnant of the Big Bang; it is the remains of the photons from the Dark Age of the universe. Since 13.8 billion years have passed and the universe has undergone a great expansion, the initial photons are now scattered throughout the universe and have become very sparse. Only a few hundred photons exist in every cubic centimeter, which equates to 3 K in temperature. Evenly spread across the entire universe, this light is called "Cosmic Microwave Background Radiation." These two engineers' accidental discovery proved to be the most powerful proof for the Big Bang Theory, and the two were awarded the Nobel Prize in Physics in 1978 for that reason.

At the same time the universe was expanding from the massive force of the Big Bang, atoms were being brought together by gravitational force to form huge clouds. Two hundred million years after the Big Bang, these atom clouds had finally been compressed tightly enough so that stars could be born. At this time, the universal temperature—that is, background radiation— had dropped to 30 K. The universe's sky had changed from the earlier yellow and red to the darkness we see today, with dots of stars twinkling in the distance. Galaxies began to form as well; 13.8 billion years after the Big Bang, the universe is still continuing its outward expansion.

Two: The Universe and the Milky Way

There is no question that the Milky Way is also a product of the Big Bang, yet unlike the cosmic Big Bang theory, there is no consistent view regarding the formation of the Milky Way. The general belief is that a large cloud of atomic gas gathered due to gravitational force and formed a relatively enclosed and independent space shortly after the universe was created. Under gravitational force, a number of smaller enclosed and independent air masses formed within this large enclosed air mass; these smaller air masses became more and more dense, and their internal temperatures rose higher and higher. About two hundred million years after the universe formed, they ignited their own hydrogen nuclei one by one, producing enough heat to set the air masses

aflame and form the first generation of stars. That original gas cloud encompassing hundreds of millions of stars evolved into one giant galaxy: the Milky Way.

According to research today, the Milky Way is a barred spiral galaxy comprised of a large number of stars. Some people compare it to the discs athletes throw, since it is also round, thin, and convex in the center. Along the diameter of this "disk," we call the center the Galactic Center, and the convex part surrounding the center the Galactic Bulge, with the galactic disk and halo ranging around it.

The Galactic Center of the Milky Way is flat and spherical in shape, measuring 16,000 light-years in diameter and about 13,000 light-years in thickness. It is densely populated by stars and is filled with dense interstellar matter and nebula. According to observation, there is a supermassive black hole in the nucleus area, supported by the existence of strong cosmic ray radiation, which is evidence of black hole phagocytosis.

The area around the center is semi-densely populated by stars and called the galactic disk; it measures 100,000 light-years in diameter, with a thickness of about 3,000–6,000 light-years. It is thicker near the center and thinner around the edge. The spherical shape surrounding the galactic disk is called the halo; it is about 100,000 light-years in diameter and is sparsely populated with stars, most of which are older and mineral-weak. Within the halo, some stars have aged to the last period of their star-life, and some of the larger ones even scatter their heavier elements through supernova explosion. These scattered elements land on the disk and become the "material" that form new star systems.

The galactic disk has a spiral arm structure that extends from the inside out, approximately symmetrical to the Galactic Center. The spiral arm contains more young, bright, metal-rich stars with denser galaxy dust, and it is also where stars are born. The Milky Way galactic disk has four spiral arms: the Norma and Cygnus arm, the Sagittarius arm, the Scutum-Crux arm, and the Perseus arm. At present, our solar system is located in the Orion arm, which is a minor spiral arm. The sun is 27,000 light-years away from the Galactic Center and slants about twenty-six light-years north off the surface plate; it revolves around the Galactic Center at a rate of 220 kilometers per second. Even at such high speed, one full rotation around the Galactic Center takes approximately 250 million years; thus, we call 250 million years one galactic year.

When we observe the sky with the naked eye, we cannot see the spiral nebula of the Milky Way, nor the spiral arm structures. In a clear summer night sky, all we can see is a bright river of stars stretched across the sky. This is because we are situated in the galactic disk and can only observe a side view of the Milky Way, so it will always look ribbon-shaped to us. There is a brighter, denser area near Sagittarius—that is the nucleus of the Milky Way.

In gross estimation, there are about two hundred billion stars in the Milky Way (some scientists believe the number to be much higher—as much as two thousand billion galaxies) and around 300 billion galaxies in the universe. This is an extremely vast number. With so many stars and galaxies out there, it is humanly impossible to count them one by one. Even if every single person in the

world spent their life counting, it would not be enough to tally all the stars in the universe. In fact, the number of stars and galaxies is obtained through “weighing.” It is calculated according to the orbit patterns of stars and galaxies.

Our galaxy is a relatively large galaxy within the universe, and it is not alone—there are about ten smaller galaxies surrounding it. Each of these galaxies has stars ranging in number from billions to tens of billions; there are even some dwarf galaxies with only a few million to hundreds of millions of stars. The Milky Way rules these galaxies through its gravity and dictates their movement. There are also bigger galaxies neighboring the Milky Way. In this lineup, the Milky Way can only claim second, with the Andromeda Galaxy reigning supreme. The Andromeda consists of nearly one hundred billion stars, and it rules more than ten smaller galaxies as well. In addition, there are some galaxies smaller than the Milky Way and Andromeda that are not governed by the two, but rather connected internally to form an independent, giant celestial system. We call this celestial system a “galaxy cluster,” or “galaxy group.”

The independent celestial system in which the Milky Way is located is relatively small, with only thirty galaxies. It does not quite reach the quota for a cluster—only a group. We call it the Local Group. Other galaxy groups near the Local Group include the Sculptor Group, the M81 Group, and the Virgo Cluster.

Galaxy groups (clusters) are all individually independent within the universe. As we know, galaxies are all moving away from each other, but that is not the case for the members in the Local Group. Apart from the ten or so satellite galaxies orbiting the Milky Way, the Andromeda galaxy, two hundred light-years away, is speeding towards us at a rate of 120 kilometers per second. According to this calculation, it will meet with the Milky Way in thirty billion years.

In our universe, galaxy groups (clusters) are not the real giants; superclusters are celestial systems even larger than galaxy groups (clusters), and they take the throne. Superclusters are also known as second-order clusters and are comprised of smaller galaxy clusters or galaxy groups. The Local Group Galaxy Cluster is part of the Local Supercluster, which encompasses the Sculptor Group, the M81 Group, and the Virgo Cluster. The Local Supercluster contains about fifty galaxy clusters and galaxy groups, totaling thousands of galaxies. It is a flat, giant cluster of galaxy clusters with the Local Group located along its edge. The center of the Local Supercluster lies in the Virgo Cluster, sixty million light-years away. The Milky Way revolves around the center of the Virgo Cluster, completing one orbit about every one hundred billion years.

The two superclusters relatively close to us are the Perseus-Pisces Supercluster, twenty-five million light-years away, and the Hercules Supercluster, five hundred million years away. There is vast empty space between superclusters. In that distance of hundreds of millions of light-years, even the existence of interstellar material is extremely rare, not to mention celestial bodies.

The celestial system one level higher than superclusters is the cosmic universe we can observe today, called the metagalaxy. Because humans are still limited in terms of observation, the universe we can observe today is still far from the entirety of the universe.

In March 2016, the Hubble telescope observed the most distant galaxy we have discovered to date—the GN-z11, also known as the infant galaxy—13.4 billion light-years away from Earth. This is a very exciting record, as it not only conveys a far-off distance, but also a very distant time. As light travels, it not only produces distance, but it also brings information from the past; 13.4 billion light-years is not only the distance between two galaxies, but also the ancient information that a distant galaxy sends us. In other words, the infant galaxy we see today is not its current form, but a galaxy from 13.4 billion years ago. The infant galaxy existing now has far surpassed our current observations. It is important to note that the theoretical history of the universe is 13.8 billion years, which means that we can now observe any galaxy born four hundred million years after the creation of the universe.

Is it also possible to gain an ultimate panoramic view of the entire universe as we continue to improve our observation techniques? It is theoretically impossible to achieve this ultimate goal. Hubble's law tells us that the farther away a galaxy is from us, the faster it is moving away from us, since light has the fastest speed in nature. The farthest galaxies we observe today are already speeding away from us at a rate close to the speed of light, and farther-off galaxies are speeding away even faster. On one hand, they are moving away from us at a speed close to that of light, while on the other hand their light travels to us at the speed of light; these two opposing speeds offset each other. Just as we cannot produce actual distance on a treadmill, so the farthest corners of the universe can never be exhausted.

Now that we understand the macro structure of the universe, let us go back to comprehend its microstructure. We are in the stellar period of the universe's history. According to theoretical calculations, this period should continue for hundreds of billions of years. The main players of the stellar period are naturally stars, and the sun we rely on for survival is one such star. When we peer into the night sky at the sparkling stars, we actually see stars burning in the distance. We can see a limited number of stars with the naked eye—only about 6,000 or so. The actual number of stars is trillions of times more than what we see. Many stars have already died and become white dwarfs, neutron stars, or black holes; they can no longer burn.

Stars are not static. Just as the sun orbits around the Galactic Center, other planets orbit according to certain rules as well. Stars do not exist in isolation either; they have many members in their families. First there are the planets that are gravitationally attracted to the stars—our Earth is one such ordinary planet in the solar system. Celestial bodies that orbit planets are called satellites. Satellites are also members of the stellar family, but they are controlled by the gravitational force of planets. The moon is the earth's satellite. Satellites are not the smallest celestial bodies in the stellar system; in addition to satellites, there are many asteroids, comets, meteorites, and interstellar media that also react to the star's gravity. All of these are members of the stellar family.

The space between stars is not necessarily a vacuum either. Interstellar gas and dust, cosmic rays, particle flow, and interstellar magnetic fields all exist in that in-between; they are collectively referred to as "interstellar material." Interstellar material is extremely thin and unevenly

distributed. During astronomical observation, concentrated cloud-like objects, called nebula, are often found in space. These are areas where interstellar material is more concentrated.

Stars are not evenly distributed in the galaxy. They tend to group in denser concentration towards the center of the galaxy and in sparser concentration along the edge. In the Milky Way, the nucleus is densely populated with stars, while the halo is more sparsely populated. This rule does not only apply to spiral galaxies like the Milky Way but holds true in elliptical galaxies, disk galaxies, and irregular galaxies as well. Apart from the distribution patterns mentioned above, some stars also form stellar cluster under the influence of gravity. These clusters have tens of thousands to tens of millions of stars, forming smaller stellar systems of their own. Stellar clusters can be divided into globular clusters and open clusters; they are all members of the galaxy and belong to the stellar family.

In the universe, dark matter and dark energy far outweigh visible matter. It is speculated that visible matter makes up only 5 percent of the universe's matter, with the vast majority being dark matter and dark energy. With the current levels of science and technology, we know little about dark matter and dark energy, but we can determine their existence. If the actual rotational speed of a rotating galaxy is faster than its theoretical speed, we can deduce that there is non-visible matter accelerating its rotation. Likewise, if the expansion of the universe exceeds its theoretical speed, that means dark energy is playing a role.

Three: The Solar System and Earth

To understand the solar system and the earth, we must first start with their formation. In the Milky Way and in other corners of the cosmos, new stars form constantly. This phenomenon has been confirmed through astronomical observation, and the formation of the solar system can also be inferred from the formation of other stars.

The general belief is that the solar system was a gray cloud cluster before its formation, made up of countless air masses and dust particles. Most people believe that this cloud was a remnant of an exploding star that was tens of times larger than the sun. After the initial explosion, the debris was extremely hot, and it did not start to cool or darken in color until many years later. Due to the inherent gravity of the material, these substances slowly gathered together and became concentrated, with the central part becoming especially condensed. Through the role of gravity, the central area rose in temperature and density, indicating the birth of a new star; such birth processes were commonplace in the universe.

As the center of this air mass became increasingly dense, its core temperature reached ten million degrees. Volatile hydrogen nuclei finally gathered enough momentum to break through the electromagnetic barrier and collide, thereby creating nuclear fusions. The huge amounts of energy and light produced through nuclear fusion radiated out, creating a new star—that was the formation of our sun. Through analysis of the heavy elements in the solar system, we can deduce the sun to be a third- or fourth-generation star. As a star, the sun's age is calculated from the moment of its nuclear fusion, dating back about five billion years.

As the sun formed as a star, the planets around it were also forming. Initially, there were many asteroids in the outer area of the solar system cloud cluster; the largest measured hundreds of kilometers in diameter while the smallest were only a few hundred meters in diameter. There were hundreds of millions of such small asteroids, and in addition, large amounts of rock fragments and ice existed as well.

Because these asteroids were so large in number, there was constant collision between them. Some such collisions produced comminuted explosions, resulting in numerous minute particles, while some smaller asteroids were absorbed by bigger ones during collision, causing them to grow in size. These collisions continued for many years until one day an asteroid gained enough mass to stand out from the group. The gravitational force of this bigger asteroid caused the surrounding asteroids to collide with it more frequently, making it more powerful at the same time. After many more years of collision, a planet was finally born. Our Earth was one such planet, born 4.6 billion years ago. Thereafter, the collisions lessened in frequency until finally tapering into calmness, and the earth entered a period of stability.

The solar system has eight planets, with Mercury being closest to the sun, and Venus, Earth, Jupiter, Saturn, Uranus, and Neptune following in order.

The moon is Earth's satellite and is the astronomical body closest to Earth, with an average distance of 380,000 kilometers. Within the solar system, apart from Mercury and Venus, the other six planets all have their own satellites. Jupiter has the most, with sixty-nine confirmed satellites, while Saturn ranks second with sixty-two confirmed satellites. In addition to the eight planets and their respective satellites, dwarf planets, asteroids, and comets also exist in the solar system. Meteorites and interplanetary medium are also essential members of the solar system family.

As the absolute leader of the family, the sun's mass accounts for 99.85 percent of the total mass of the solar system. The total mass of all eight other planets account for less than 0.135 percent. The planets' satellites, comets, asteroids, meteorites, and interplanetary medium only account for 0.015 percent of the solar system.

Current scientific capabilities are enough to prove that the earth is the only planet with intelligent life in the solar system. No other planet has the environmental conditions to nurture and support intelligent life. After further studying the conditions required to produce intelligent life, one conclusion is certain: the true miracle of the solar system is the emergence of human beings. Even the formation of the sun pales in comparison, as there are countless stars in the universe, but very few star systems capable of producing intelligent life.

SECTION THREE: THE ORIGIN OF MAINKIND

One: Humans are the Product of Evolution

Today we can say with certainty that humans are the product of evolution—a miracle of life formed through mutation, inheritance, and natural selection.

Humans and Hominoidea (apes) originate from the same ancestor, the earliest of which can be traced back to Africa. Apes are a close relative of humans, while chimpanzees, gorillas, and orangutans have all shared common ancestors with humans.

The ancestors of mankind can be traced back to the Egyptian ape about thirty million years ago. Around ten to twenty million years ago, humans and apes began to move in two different evolutionary directions; one developed into the modern human, and the other developed into the modern ape. However, the Egyptian ape cannot be called the ancestor of mankind. The true ancestor of mankind—the first to step over the human threshold—is the Australopithecus.

The Australopithecus lived in Southern Africa about 4.4 to 1 million years ago; its brain capacity was about 35 percent of the modern man's, which is 20 percent higher than that of the chimpanzee.

The early Australopithecus was divided into two branches: one burlier in build, and the other more slender. The burlier branch was eliminated through evolution in the Pleistocene epoch, while the slenderer branch evolved into the ancestors of mankind. The burlier branch evolved studier, stronger limbs to better adapt to the environment; the slenderer branch evolved brainpower and flexibility to better suit their living environments. As evidenced by reality, wisdom of mind surpasses strength of body and is more conducive to adapting to the environment.

Currently, recognized fossils of Australopithecus have only been discovered in Africa. So why did humans and apes split ways on the path of evolution? Archaeological excavations of Africa and the Arabian Peninsula have yielded the following conclusions:

The Great Rift Valley split East Africa into two halves from south to north. A series of canyons and lakes formed a natural barrier between the biology existing on the east and west sides, creating two independent developmental environments. The Australopithecus living in the west adapted well to the moist grove environment where rain and food sources were abundant and survival was easy. They evolved to become today's living apes. On the east side, the environment was much harsher. The climate was dry and food source was scarce. The Australopithecus had to struggle in order to satisfy basic survival needs. They had to prevent attacks from large carnivores and also ward against sudden volcanic eruptions. Due to these difficult conditions, many perished and only a small portion survived and evolved to cross over the human threshold. Therefore, humans come from the small number of winners who survived the struggle against a harsh world. We are the strongest adaptors.

Between 1.9 million and 1.65 million years ago, the earliest group capable of manufacturing tools appeared. They were known as Homo habilis. The fossils of Homo habilis were first discovered in the Olduvai Gorge in Tanzania. Other fossils were discovered later in other parts of Eastern Africa. The Homo habilis possessed much larger brain capacity than the Australopithecus, reaching more

than 50 percent of the capacity of the modern brain, with similar overall shape and grooves. Homo habilis were capable of attacking beasts with simple stone tools, cutting fur, and mashing nuts, and they might possibly have possessed linguistic communication skills.

The genus member more evolved than Homo habilis was Homo erectus. Homo erectus fossils were first discovered in the Trinil area of Java, Indonesia, in 1891. Fossils were also found in other parts of the world. With the exception of the Americas and Oceania, Homo erectus fossils were found in Africa, Asia, and Europe. China's Peking Man and Lantian Man are all Homo erectus.

The Homo erectus lived between two million to 200,000 years ago. Their brain capacity was over 60 percent of the modern man's, and they were able to create very sophisticated stone tools.

The most important characteristic of the Homo erectus was the ability to use fire. The use of fire not only made meat more delicious and previously inedible things edible, but it also prevented against animal attacks and guaranteed warmth in the winter. Fire played a critical role in the ultimate separation between humans and animals . . . and the final evolution of man.

The evolutionary species that came after Homo erectus was Homo sapiens. Homo sapiens can be divided into early Homo sapiens and late Homo sapiens.Early Homo sapiens lived around 300,000 to 100,000 years ago, and late

Homo sapiens lived 100,000 years ago. Late Homo sapiens were anatomically similar to modern humans, which is why modern humans are known anatomically as Homo sapiens.

In addition, about 120,000 to 30,000 years ago, a highly evolved race known as the Neanderthals lived in Europe and West Asia. Neanderthals are so named because their first fossils were discovered in the Düssel River's Neander Valley; they are also occasionally called "the Neanderthal Man." Neanderthals do not belong to the same species as the modern man but are a species of archaic humans, while modern humans fall under the Homo sapiens species. However, according to recent studies, scientists believe that Neanderthal genes can be found in most modern humans, which means that modern man had sexual contact with Neanderthals. Although Neanderthals became extinct some thirty thousand years ago, modern man has passed on information from the Neanderthals, to some extent.

Two: The Characteristics of Human Evolution

Humans, like all other animals, are the product of evolution, yet humans went down a completely different evolutionary path. In the bitter cold of the Ice Age, nature evolved the woolly rhino and mammoth, providing Rhinocerotidae and Elephantidae animals with thick fur and skin to withstand raging cold winds; to adapt to thick-skinned herbivores like the woolly rhino and mammoth, the saber-toothed tiger evolved out of feline predators; the antelope developed speed to

outrun carnivorous predators; the giraffe evolved from Ruminantia to reach higher vegetation; the hedgehog developed burrs to protect itself; the chameleon evolved to change color according to its surrounding in order to better camouflage itself, and so on.

The evolution of mankind differs significantly from all other animals. Man started evolving through the brain. All of their environmental adaptions are based on the brain (relative to the evolution of the brain, the other aspects of evolution are secondary). Counting from the starting point of evolution, humans have increased their brain capacity threefold in less than ten million years. Mastering this key of evolution was very important; once humans completed this evolutionary process, it was taken for granted that they became masters of Earth.

SECTION FOUR: THE ORIGIN OF HUMAN CIVILIZATION

One: From Barbarism to Civilization

Humans have evolved from animals. About three million years ago, the ancestors of man learned to use stone tools. About 500,000 years ago, the use of fire expanded the scope of food and helped man's ancestors overcome the cold, allowing them to move out of the warm climates of lower latitude Africa towards Asia, Europe, Australia, and the Americas. Humans migrated in the pursuit of food constantly, and in large groups. This migration process took very long. Australia was reached about fifty thousand years ago, and the Americas were only reached fifteen thousand years ago.

The social development of human beings has always been relatively small. This social organization existed in the form of primitive communes; any person who obtained food had to share it among the collective, and every person had the right to share in collective food source.

Because the demands of life—that is, basic food—were very simple, and the number of humans distributed around the world was small enough to easily assure such demands, people had ample leisure time. Once enough food was obtained, all remaining time could be used for rest and entertainment. That is why many scholars believe that late Paleolithic humans were happier and more relaxed than people today.

The first major change in human lifestyle and the formation of human society occurred about ten thousand years ago. During this period, the manufacture of stone tools became much more sophisticated, evolving from earlier striking methods to polishing techniques, coining this time the "Neolithic Age."

The most revolutionary change for mankind was the mastery of plant and animal domestication. Planting and keeping animals provided a much more stable lifestyle compared to the migratory way of hunting and gathering. It offered more security as well, allowing people to settle down. This change in production methods was later known as the "Agricultural Revolution."

The Agricultural Revolution fundamentally changed life and social structures for humans. After settling down, people formed family units and villages. Compared to the gathering method, planting and farming greatly improved the efficiency of land usage, permitting villages to expand and far exceed the human groupings of the gathering era. The efficiency in production created enough surplus for storage, sparking conflict and war. To better ward off foreign invasion, two or more villages would unite to form a tribe, further expanding the scale of human society.

In the late Neolithic period, people invented metal-smelting technology. The first metal to be smelted was copper. Adding a small number of additives to copper enhanced its performance quality. Bronze is produced by adding small amounts of tin to copper.

Pottery and weaving also emerged in this era. With the development of agriculture, irrigation and water conservancy projects also arose; complete and intricate agricultural irrigation systems existed in Mesopotamia and Egypt more than six thousand years ago.

Before the Industrial Revolution took place more than two hundred years ago, the center of human civilization was firmly fixed upon the Eurasian continent and the African region north of the Sahara Desert. (Unless otherwise specified, we will call this “North Africa” in this section.) Due to the swamps in the Sahara Desert and the upper reaches of the Nile, North Africa and the Eurasian continent shared more contact, while the African region south of the Sahara (referred to as “South Africa,” unless otherwise specified) was isolated from the hub of civilization on the Eurasian continent. The Americas and Australia also existed in relative isolation.

The ancient Eurasian continent and North Africa possessed 90 percent of the population and the most advanced civilization. Among some of the most important ancient civilizations that existed here were: the Mesopotamian civilization along the Tigris and Euphrates rivers; the Egyptian civilization along the Nile; the Indian civilization along the Indus and Ganges rivers; the Chinese civilization along the Yellow River and Yangtze River; and the Minoan civilization of the Mediterranean Crete.

It is worth mentioning that many nomads lived outside of civilization on the vast expanses of grassland north of Eurasia, from the northeastern part of China in the east to the Hungarian planes of central Europe in the west. These powerful nomads traveled south to pillage and plunder civilized areas every chance they got, destroying buildings and spilling blood in their wake. They were the destroyers of civilization; however, they were also the messengers of civilization, as they brought Eastern civilization and technology to the West, and Western civilization and technology to the East.

Different ancient civilizations came into being at different times, with only indirect influences between them. Chinese civilization especially experienced less influence from other civilizations due to its far-off location in the East. Due to long distance and inconvenient traffic, the basic principles of civilization only journeyed from one place to another after many years. Only after accepting these basic principles—and only these basic principles—did the major civilizations start to flourish, each with their own characteristics.

Every civilization is always under constant destruction and reparation. The main destruction comes from war, but natural disasters like earthquakes and volcanoes also play a part, albeit a secondary one. Some civilizations were destroyed and never rebuilt, like the Minoan civilization on the island of Crete. It was destroyed without a trace left; even the subsequent Greek civilization did not accept much of its influence. Some civilizations are repeatedly destroyed and reconstructed; this reconstructed civilization is impacted by its predecessor, but its core values often undergo great change. Mesopotamian civilization, Egyptian civilization, and Indian civilization all have such features. However, there is one other civilization that has been damaged and rebuilt many times but has managed to continue uninterrupted: the Chinese civilization.

Two: The Pace of Civilization

Ancient civilizations can only be regarded as primitive civilizations, as human civilization did not stop its in-depth development after its establishment. As civilization develops in depth, it also develops in scope. When ancient civilizations were conceived, they were like single, isolated islands floating in the corners of the world, surrounded by barren land. These “islands” were like sparks of flames, constantly burning and expanding, influencing the areas around them until all civilizations connected into a whole. This period is called the Classical Era or Classical Age by scholars.

For the purpose of this section, we will continue to use the Eurasian continent and North Africa as the main subject of observation. We know that in the earlier stages, a series of small city-states formed in the major civilized areas. These small states coveted each other’s wealth and resources, so constant battles ensued. As war raged, the more powerful states gained in power while weaker states were swallowed up. As states expanded in scale, the battles between small states became wars between large nations; the scope of civilization continued to expand, eventually forming one whole.

The emperor Qin Shi Huang was the person to first unify Chinese civilization. Early Chinese civilization was confined to the small area near the middle reaches of the Yellow River. As civilization spread, a number of small vassal states were formed, all of which were nominally affiliated to the Zhou dynasty. In reality, the Zhou dynasty only had control over the limited area around itself. By third century BC, only seven larger nations remained due to war and the merging of vassal states. Among them, Qin—a nation developed from border tribes—was the strongest in power. Under these circumstances, Qin Shi Huang destroyed the six other countries over one decade of conquest, establishing a unified Qin dynasty in 221 BC.

Indian civilization was united by the Maurya dynasty. During the rule of Ashoka, a series of successful expeditions were launched, joining Indian civilization as one. In the time that followed, the neighboring civilizations of China and India developed along different respective paths. Indian civilization spent more time divided, while Chinese civilization spent more time united.

Roman civilization was an important component of European civilization; it is both a sister civilization and a continuation of Greek civilization. In its heyday, the Roman Empire spanned Europe, Asia, and Africa, surrounding the entire Mediterranean. Its origin can be traced back to the Roman citystate on the Apennine Peninsula. After centuries of war, the Romans united Italy. Then they conquered many countries along the Mediterranean over more centuries of war, forming the huge Roman Empire. During Rome's prime, its contemporary, China's Han dynasty, equaled it in size and power, making the two the respective East and West cores of civilization.

The middle and later parts of the millennium BC was a time of great ideological advancement for humanity. Due to great unrest, centuries of war, and long periods of divide experienced by the major civilized areas, people thought long and hard about the universe, life, ideal societies, ideal governments, and moral ethics. A great number of outstanding thinkers emerged, and their thoughts pushed humanity into maturity. Under the guidance of these ideological masters, human society rationalized in leaps and bounds. The influence of these thinkers lives on, remaining rooted in the depths of human society until this day.

In the five hundred years between 770 BC and 221 BC, philosophers, thinkers, military strategists, and educators like Laozi, Mozi, Confucius, and Sun Tzu flourished in China. India's Buddha was a contemporary of China's Confucius; he was born during a time of great social upheaval in India. Buddha observed the pain people suffered through aging, sickness, and death, prompting him to agonize over the meaning of life and ultimately create Buddhism.

In the same period, Greek thinkers replaced the mysticism of religion with scientific rationalism. Their philosophical speculation started with the understanding of nature, asking and answering questions freely using rationality. In time, a number of outstanding rationalist thinkers and scientists like Socrates, Plato, Aristotle, and Archimedes appeared.

In the history of ideology, another far-reaching event would take place later. Jesus created Christianity in the first century AD.

Human history has always been accompanied by war, and this period was no exception. However, two wars must be mentioned, for they impact all of human history. The first war was the eastward campaign of the Macedonian king, Alexander the Great. After Alexander inherited the throne, he unified most of Greece through a series of wars, and then he launched a war against the powerful Persian Empire. His conquest was unstoppable. Although the Persian Empire was much larger and had more troops, it crumpled under the iron fist of Alexander the Great. After conquering Egypt in the south, Alexander advanced eastward until he hit the river basins of India.

Alexander the Great held great respect for Greek culture, so he was determined to spread Greek civilization to the corners of the earth. He realized, however, that the brilliant oriental civilizations were not inferior and sometimes were even more marvelous than Greek civilization, so he became a facilitator of culture exchange instead of cultural invasion.

The other war worth mentioning was the war waged by the Eastern Han Dynasty against the Huns. The Huns were a strong, nomadic tribe in northern China, long accustomed to harassing the Chinese Empire to its south. Relying on the strength of his empire, Emperor Wu of Han launched a series of large-scale wars against the Huns. As a result of these wars, the Huns were greatly weakened, and a portion of the Huns joined the Han dynasty shortly after, while the rest fled into the depths of the desert. The fleeing of the Huns invoked a great migration in the history of the world. This migration lasted hundreds of years, changing the course of world history.

At that time, there were many strong ethnic groups living on the Eurasian grasslands; the Huns were one of the strongest. As the Huns migrated westward, they occupied the lands of other nomadic tribes. Unable to contend with the fierce Huns, these tribes were forced to move farther west into other nomadic territories. Many Germanic tribes had occupied the grasslands of central Europe and were now crammed into the small area in the north of the Roman Empire during this migration. At every opportunity they would travel south to rob wealthy Romans.

During this time, the Roman Empire divided into two parts. The Eastern Roman Empire (also known as the Byzantine Empire) was still strong, so the Germans had less opportunity for looting. The Western Roman Empire was in decline, and after repeated invasions it was eventually occupied by the Germans in 476. The demise of the Western Roman Empire holds major significance. Historians use the fall of the Western Roman Empire as a dividing line, denoting the thousand years following the fall as the “mid-century.”

Three: The Century of the East

After the Western Roman Empire fell, the Byzantine Empire continued to survive for nearly one thousand years, striving to continue the splendor of the Roman Empire. The Justinian period in particular tried to restore the territory of the Roman Empire, achieving some success. But overall, the Byzantine was on the decline; its rule shrank more and more and the nation weakened gradually until it was destroyed by the Ottoman Empire in 1453.

Europe was most often dominated by barbarians. Under their rule, almost all of classical European civilization was destroyed. Only the Roman religion was inherited. During this period, European society was scattered and divided into many small countries. Religious rule rose above imperial power, achieving dominance. As cultures suffered destruction, religious rule strictly imprisoned people’s minds, casting Europe into a cultural desert; academic circles call this period the “Dark Ages.”

To say that the entire world was shrouded in darkness during the Dark Ages is a gross generalization. The lack of creativity was only restricted to the West; the East experienced a great prosperity of culture. The number system we call “Arabic numerals” was developed in this period by the Indian people and was spread to Europe by the Arabs. The Arabs also absorbed the mathematical achievements of the Indians and Greeks to create their own unique mathematical

accomplishments—algebra was one especially brilliant achievement. Arabs also experienced successful creative achievements in astronomy and medicine.

During the Medieval Period (fifth to fifteenth century), China contributed the most significant cultural achievements of all. Most of the world's scientific and technological advancements came out of China in this period; among them, the four great inventions—the compass, paper-making, gun powder, and printing—made the most significant contribution to human society. China's four great inventions quickly spread to the Arabs and Persians, who later brought them to Europe.

Obviously, the abovementioned creations and inventions are not the full scope of medieval cultural development in the East. The Eastern world also achieved remarkably in the fields of literature, art, and philosophy.

The rise and expansion of Islam was another very influential event of the Middle Ages. Muhammad not only created the Islamic religion, but he also spread it through war and missionary work, thus uniting the Arabian Peninsula. His successors continued to promote the spread of Islam and expand the territory of Arab countries, ultimately forming a religious nation of unprecedented scale. This religious nation covered a variety of different areas and spanned all three continents of Europe, Asia, and Africa. The rise and spread of Islam created conflict with Christianity. The famous Crusades raged from 1096 to 1291 as the war was fought over control of Jerusalem, as well as numerous other cities and religious sites.

At the beginning of the thirteenth century, a powerful nomadic nation sprung up on the grasslands of northern China: the Mongol nation. Genghis Khan and his descendants used brutal war tactics to carry out invincible conquest. The Mongols built an empire of unparalleled reach. Starting in China from the East and encompassing Korea, it reached Poland and the Baltic Sea in the West, and Mesopotamia and the Arabian Gulf in the West. Most of the Eurasian continent was included in the territory of the Mongol Empire.

In Europe, the Germans broke into many small countries after conquering the Western Roman Empire. Among them, the Franks established the most powerful kingdom. Relying on support from the Pope, two generations of Franks rulers, Pepin and Charles the Great (also known as Charlemagne), conquered and built an empire that encompassed most of Europe. Since this empire rose to its peak during the rule of Charles the Great, it is known as the Charlemagne Empire. Shortly after the death of Charlemagne, the Charlemagne Empire split into east, central, and west portions; these would later become Germany, Italy, and France. These three countries played a very important role in European and world history—one that persists today.

The original people inhabiting England were called the Celts; they later came under the rule of the Roman Empire. After the Western Roman Empire was invaded by the Germans, England was occupied by two smaller Germanic tribes, the Angles and the Saxons. Anglo-Saxons became the masters of this land thereafter.

Four: The History of the World

When Christopher Columbus discovered the Americas in 1492, the American people were still in the early stages of the Agricultural Revolution. They had domesticated over one hundred types of crops—no less than Eurasian cultures— but farming only made up a small portion in their production. Most of their food was obtained through the more primitive method of gathering.

Prior to this, the Americas had formed three large areas of civilization. The Mayan civilization of Central America was a leader in arts and technology; they created imaginative architecture and sculptures and also mastered considerable mathematical and astronomical knowledge. The Aztec civilization was located in Mexico; they were an aggressive people that staged tribal wars to capture prisoners in order to sacrifice their hearts to the gods. This sacrifice was to ensure victory in battle, while victory in battle was meant to produce more captive hearts to sacrifice for victory. This produced a vicious cycle that fed war with more war. The Inca civilization in Southern America had the relatively highest level of civilization; they had formed an empire called the Inca Empire. The Inca Empire had a unified religion, the Inca religion; they practiced state-ownership when managing land, mines, and other assets, and they had a centralized conscription and taxation system. In comparison, the Mayan civilization and the Aztec civilization were still in tribal stages.

When the British arrived in Australia in the late eighteenth century, they found the land even less civilized than the Americas. There were about 300,000 indigenous people living in Australia, all still stuck in the Paleolithic Age. They could only use the simplest tools, such as sticks and rough stones, their social structure was still in the group stage, and they generally did not wear clothing apart from a few decorative objects.

South Africa was much more civilized than the Americas and Australia, but the development there was extremely uneven. The development of South Africa should be attributed to the introduction of agricultural and smelting technologies from the Asian and European civilizations; this allowed them to enter the agricultural period early on. The introduction of Islam also helped to promote cultural development.

Columbus' discovery of the American continent was a milestone in human history. He believed that he had circled the earth and reached Asia on the other side. Although Columbus died without realizing his mistake, the significance of his discovery cannot be diminished. No matter how many people had previously believed that the earth was round, it was only after Columbus' geographical discovery that this conclusion was cemented. (In reality, the first person to actually conclude a successful round the world voyage was Ferdinand Magellan.) People started to view the history of mankind through a global perspective. Before this, people had always believed the world to be composed of the Asian, African, and European continents alone. This is why the academic community generally agrees to use Columbus' discovery of the Americas as the sign of humans entering a global era.

The start of the global era is also marked by bloodshed. Spanish colonialists in the Americas began first with the plunder of gold, silver, and jewelry, and then continued relentlessly to occupy

land and resources. They used trickery and betrayal to gain the trust of Native peoples, and then they brutally killed their chiefs and kings. The European colonialists who came after the Spanish killed and plundered in the same vein. Arguments vary concerning the exact number of Indians killed in the end, but one thing is for certain: the dead far outweighed the survivors. The Indians living on the West Indies suffered particularly heavy losses; they were nearly wiped out. Many Indian villages on the continent were also destroyed until few people were left alive.

As the indigenous peoples of the Americas were largely slaughtered by colonialists, a manpower shortage occurred in the development of the Americas, giving rise to the slave trade. European slave traffickers sold African slaves to the Americas for huge profits. The slave trade was extremely cruel and savage. Some information indicates that about one black slave out of every four died in the transportation process due to the harsh trafficking practices. The slave trade caused the population of Africa to terribly decrease.

The colonization of Australia did not start until the late eighteenth century. Most immigrants were criminals sent to Australia due to overcrowding in British prisons. The arrival of these people rained destruction on the aboriginal people; they killed indigenous people as if it were a hunting sport, destroying over 90 percent of the population.

With the discovery of the Americas and Australia, Western Europe started a massive expansion and colonization operation. Portugal, Spain, France, and Britain all established colonies overseas. As a late bloomer, Russia limited its expansion to its immediate surroundings. As time has proven, this kind of peripheral expansion is much more effective than overseas expansion. Today, Russia's territory ranks first in the world, the result of its continuous expansion over many centuries.

The overseas colonies established by the Europeans developed a new national consciousness over time, giving rise to continuous conflicts between them and their sovereign nations. The demands for independence by the colonies grew louder and louder, spearheaded by the thirteen British colonies in British North America. On July 4, 1776, the colonies declared independence, establishing the United States of America while the territory now known as Canada remained loyal to Britain.

Encouraged by the independence of the United States, a new wave of demands for independence arose in the colonies outside of the Americas. After a long and arduous struggle, these colonies all gained their independence.

Five: Emerging from the Middle Ages

Emerging from the Middle Ages had completely opposite consequences for the East and the West. Western Europe's creativity exploded after many years of constraint, propelling it to the forefront of the world. Meanwhile, in the East, creativity, which had previously been in the lead, became inexplicably suppressed, gradually falling behind.

In Europe, the writings and ideology of Classical Era Greek rationalist thinkers had been forgotten and lost. Taken by the Arabs to study, these writings gained new splendor. When the Crusades moved East in the conquest of the Muslims, Christians unintentionally discovered these works that had originally belonged to their ancestors. They translated the works of Plato, Aristotle, Euclid, and Ptolemy from Arabic into Latin. The rediscovery of these rationalist masterpieces refreshed the minds of scholars who had long been confined by religious doctrines, igniting new sparks in the hearts of people, and finally erupting into the magnificent Renaissance movement.

The Renaissance took place from the fourteenth to the sixteenth century, starting in Italy and later extending into other parts of Europe. It flew the banner of European Classicism Revival, promoting an anti-church theocracy, anti-feudal ideology liberation movement. This movement was far-reaching in its influence; it sounded the horn for the development of modern civilization. In this movement, a large number of ideological liberation pioneers emerged, including poets, writers, playwrights, and scientists. Dante, Boccaccio, Shakespeare, Copernicus, and Bruno are some outstanding representatives.

The sixteenth-century religious reformation movement was a direct assault on the Catholic Church. The reform was sparked by the Holy See's selling of indulgences. According to the Church, people were born guilty, and only through purchasing the indulgences sold by the church could they find redemption. This was a barely disguised attempt at extortion. The frequent issuance of indulgences caused widespread resentment among the people. The German Martin Luther wrote a series of opposing articles attacking the sale of indulgences and introducing different religious ideologies. Following Luther, Calvin and King Henry VIII also spearheaded new movements of Christian doctrines.

The Protestant Reformation created a new Protestant Church, separated from the Catholic Church. Many people chose to convert to Protestantism, which was a heavy blow to the Holy See. Without the support of the Renaissance movement, this religious reform would have been impossible to achieve.

The Enlightenment movement was the second ideological liberation movement following the Renaissance. It originated in Western Europe, centered in France, but soon spread to other parts of Europe and the United States. Enlightenment thinkers held rationalism in high regard, aggressively criticizing theological dogma and resisting religious superstition with atheism. They opposed autocratic hierarchy with ideas of social equality; combated ignorance with science and knowledge; suggested freedom, equality, and universal love; and proposed models of ideal social systems. During the Enlightenment, a number of great thinkers like Locke, Voltaire, Rousseau, Montesquieu, Grotius, Jefferson, and Paine emerged.

The Enlightenment directly led to the establishment of modern democratic countries and the advent of the Industrial Revolution, propelling Western civilization ahead of Eastern civilization to occupy center stage of the modern world and lead the development of human history.

Enlightenment thinkers designed an ideal system that would ensure democracy and freedom by separating and facilitating mutual restraint between executive power, legislative power, and judicial power. This system is also known as the separation of powers. The nation established by the American Revolution was the first modern democratic country to be built on the separation of powers.

France was the center of the Enlightenment; the outbreak of the French Revolution in 1789 was astounding. The revolution sent King Louis XVIII to the guillotine and established a modern democratic regime. The success of the French Revolution shook Europe; it was without a doubt a great threat to the feudal autocratic regimes of other European countries. Major European powers joined to forcefully intervene in the French Revolution, and it was under these circumstances that Napoleon came to power.

Napoleon was an outstanding tactical genius. The European anti-French alliance united seven times, bringing together nearly all the major countries of Europe to attack France. Under such disparaging conditions, Napoleon's army was unstoppable, occupying most of Europe at one point. However, due to an erroneous decision to attack Russia, Napoleon's forces were almost completely annihilated. In the face of a joint offensive from strong foreign enemies, Napoleon was finally defeated. Nevertheless, the great influence of the French Revolution and the personal military genius of Napoleon lingers on.

As the Western world was being shaken by phenomenal changes, the East was still continuing in its old social order, stuck in a stagnant state. In the Muslim world, Ottoman Turkey ruled the Balkans and Middle East; the state was seemingly strong, but petrifying from within. Along its European border, it could vaguely feel the changes in Europe, but it remained untouched itself.

The ruling Mughal Empire of India had once been very strong, but its sun was starting to set as well. The empire was in a divided state. This internal division—as well as the conflict between the Muslim rulers and the Hindus, who made up the majority of the population—provided opportunity for subsequent colonial invasion.

Caught between these two major Muslim powers was the Muslim Safavid Empire, located in the Iranian Plateau. During the first half of the seventeenth century, the Safavid Empire reached its heyday, but it suffered greatly through a series of peasant uprisings, thus beginning its decline.

The most closed off of all was the Chinese Empire in the Far East. During this time, China had been ruled by the Ming and Qing dynasties. Since the early days of the Ming dynasty, the Chinese Empire had adopted an isolationist strategy, not only refusing to initiate contact with the other world, but also taking strict precautions against passive contact. The empire refused to deal in foreign trade and even strictly prohibited the people from going to sea. At the same time, the Japanese Empire ruled by the Tokugawa Shogunate also adopted a closed-door policy, missing the opportunity to communicate with and learn from the West.

Six: The West Reaches Its Summit

The Western world managed to reap huge benefits during the Discovery Era. Regardless of whether the means of obtaining such benefits were righteous or not, the end results were enormously lucrative. A series of ideologically liberating movements like the Renaissance, the Reformation, and the Enlightenment produced great social evolution. They removed the shackles of religious theocracy and the fetters of feudal despotism, forming an ideological environment and social system conducive to promoting a liberation of productive forces. It was against this backdrop that a historic opportunity once again occurred in the West: the Industrial Revolution. The Industrial Revolution propelled the West from its already advantageous position to a historical peak.

The Industrial Revolution started in the mid-eighteenth century in Britain, beginning with a series of inventions in the textile industry. The invention and application of James Watt's steam engine was an important landmark, as it drove the Industrial Revolution to develop further in depth.

The true leap of the Industrial Revolution came after the merging of science and technology. In the early days of the revolution, the application of technology was based solely on the use of practical technological inventions. However, it was only possible to create simple, intuitive inventions by relying solely on experience to solve technological problems. After applying the use of scientific theory as a guide to technology, more complex and abstract inventions were created, fostering rapid development in productivity. The combination of technology and science that took place in the late nineteenth century is called the Second Industrial Revolution.

The Industrial Revolution promoted the advent of the industrial culture in human society, and it also changed the political, economic, and military order of the world. Propelled by the Industrial Revolution, the British economy grew rapidly, eventually becoming known as "the world factory." Britain's subsequent domination of the world was entirely due to the results of the Industrial Revolution. The earliest country to accept the results of the British Industrial Revolution was the United States, while France was the first to do so in Europe. Russia also embarked on the road of industrialization after its serfdom reform. At this time, Germany and Italy were still rent by disunity.

From the years 1848–1870, Italy experienced twenty-two years of bitter, tortuous struggle before finally winning its independence. Germany's unification was entirely due to the Prussian president, Bismarck. After uniting into one, Germany began to move on the world stage as a leading power.

In 1492, when Columbus discovered the New World, most nations were still living in their own fixed areas. This situation changed drastically in the middle of the nineteenth century, when almost the whole world came under the control of Europeans, the Americas included. Although most American countries had gained independence, such independence was still under European rule or in the context of European culture. This situation held true in most other continents as well.

Europeans entered Asia on a large scale during this time. As a result, the divided and overly populated Indian Mughal dynasty was slowly swallowed by constant British attacks, until it was completely occupied and became a British colony in 1849. Although China had also undergone heavy blows from peasant risings, the country was still strongly united and the Chinese army desperately resisted European invaders. Sadly, the vast disparity in weaponry and technology was difficult to surmount. Although China managed to retain a nominal independence, it had in fact become a semicolony. The neighboring states of China were all reduced to colonies by the invaders.

Almost at the same time, Japan was also forced to sign unequal treaties under the threat of American gunboats. Although China and Japan had suffered the same fate, the two countries later adopted completely different national strategies. Suddenly aware of how far they had lagged behind, Japan went through the Meiji Restoration and received desired results. It only took them forty years or so to catch up with the pace of the world.

In 1904 and 1905, Japan and Russia broke out in large-scale war over interests in Northeast China. In that war, Japan defeated the Russian army both on land and at sea, winning a brilliant victory. The Russo-Japanese war was the first time a European country lost to a non-European country; it signified that a non-European country had entered the ranks of world powers for the first time. Prior to this, Europeans controlled all the nations and regions of the world. European history had reached an unprecedented peak.

Seven: The Modern World

The great wealth brought on by the Industrial Revolution invigorated the Europeans, yet war loomed over Europe at the turn of the twentieth century. To seek military balance, Britain, Russia, France, Germany, Italy, Austria, and other strong powers struggled to find alliances. Finally, two camps formed: the Allied Powers led by Britain, France, and Russia, and the Central Powers led by Germany, Italy, and Austria. Each camp sought their own advantages in order to overwhelm their opponents; every country bargained with its opponents for their own interest, ready to sell out allies at any time. In 1914, crisis finally ignited, and the First World War broke out, quickly spreading from Europe to the entire world. At that time, World War I was unprecedented in its destruction.

During the First World War, a revolution took place in Russia that had far-reaching repercussions. The Bolsheviks of the proletarian party led by Lenin established the world's first socialist country on November 7, 1917. The victory of the Russian socialist revolution put Marx's theory into practice for the first time, profoundly impacting the world order. After this, many countries embarked on a socialist path as well; the banner of socialism covered half the world at one point.

The great destruction brought on by World War I left a deep impression on people's minds. In order to avoid similar disasters from occurring again, the leaders of the major victorious countries

met to discuss an establishment that could end war. At the suggestion of US President Woodrow Wilson, the League of Nations was established as the first centralized international organization in human history. Its main purpose was to promote international cooperation and ensure international peace and security. The establishment of the League of Nations was the first important attempt to use international organizations to stop the spread of war.

Unfortunately, the League of Nations did not curb bloodshed. Only ten years later, a second world war would break out on an even larger scale. World War II once again set an unprecedented scope in the history of human warfare. The deep impressions it left were not only due to the huge casualties and destruction caused, but also due to the development and successful application of the atomic bomb. The two atomic bombs launched by the United States landed in Japan's Hiroshima and Nagasaki, instantly razing the two cities to the ground. Such destructive power had been unimaginable to people in the past, and it led humans to question if humanity would one day be destroyed by their own scientific and technological achievements.

After the Second World War, people thought long and hard. The leaders of the major victors met again and decided to learn from the lesson of the League of Nations and form a new international organization to safeguard against war and preserve global peace. As a result, the United Nations was formally established on October 24, 1945. Shortly after the founding of the United Nations, two military and political groups, headed respectively by the United States and Russia, formed on opposing sides. The two sides existed in strained rivalry for a nearly fifty-year period known as the Cold War. Only after the collapse of the Soviet Union in 1991 did the Cold War come to an end.

The so-called Cold War was in reality quite heated. The Korean War broke out shortly after World War II, and the Vietnam War followed after that. Other minor battles ensued frequently in various other parts of the world as well. While the United Nations did its best to stop wars, it simply could not do anything once the interests of major powers were concerned. After the Cold War, the world remained strained. The United States rose to become the number one superpower, with China rising rapidly and following on its heels. Other powerful countries like Russia, Japan, Germany, Britain, and France held strong positions as well. The United Nations was powerless to stop the actions of such countries; none of the major wars that took place after the Cold War were authorized by the UN.

A new way of killing is becoming increasingly threatening: terrorist attacks. Terrorist organizations have resorted to various means to carry out large-scale attacks on innocent civilians, often leading to casualties totaling hundreds of thousands. This has become a new kind of disaster in the world.

Looking into the development and formation of human society, we can clearly see that the cycles of human society are shortening. Before the Agricultural Revolution, the changes in human society were measured in hundreds of thousands of years; after the Agricultural Revolution, they were measured in thousands of years. The Industrial Revolution further shortened that time to mere decades. In today's world, the Information Revolution and Biotechnology Revolution

characterized by atomic energy development and computer technology have sped up the development of human society even more. This rapid increase in speed causes great uncertainty, and it means that the world will undergo great change every few years, or even every few decades. This change is reflected in human individuals and family units; in cities and villages; in the political, economic, and cultural aspects of a country; and in the overall world order. The driving force behind the shortening of human cycles is the power of science and technology.

We find that war and crime constantly accompany humans. The evolutionary phenomenon of internal competition where the strong bully the weak is fully demonstrated by humanity. Occupying the wealth of others for fun and sacrificing others' happiness for personal fulfillment has become an ironclad law of human society. In particular, it can be seen that war has always been a main theme of human history. Human society is built upon the killing of each other.

In their attitude towards nature, mankind went from passively adapting to nature, to actively adapting to nature, to actively adapting nature. Humans' demand for material wealth is endless, the demand on nature is endless, and the demand for science and technology is endless. No manner of wealth can satisfy this type of demand. Looking back at what we've lost and gained, we will see that material wealth did not bring happiness and satisfaction, but instead brought psychological pressure and a loss of security.

Chapter Two Methods and Principles

This book is focused on the study of humanity's fate, and it is committed to finding the answer to continued human survival and universal happiness. In order to ensure the rigorousness of scientific research, we must first determine the methods and principles of such research. These so-called methods and principles are what dictate the trajectory of our research and the criteria that research goals should be measured against. Without proper methods and principles, our research will lack direction and intent, and without correct methods and principles, the final conclusions will be wildly inaccurate or completely opposite to the truth.

SECTION ONE: HUMAN VALUES

The human values mentioned here refer to the needs and wishes of humans. Human values can be broken down into many categories, such as survival, happiness, pleasure, fulfillment, and so on. However, survival and happiness are humanity's most important values; all other pursuits are subservient to them. When there is conflict with the needs of survival and happiness, all other pursuits must give way.

From another point of view, survival and happiness are also instinctive pursuits of mankind, and a most basic pursuit at that. Every human individual, every human group, and humanity as a whole are striving for survival and happiness. No normal person takes survival and happiness lightly.

We say that survival and happiness are the most important values of humanity, but that is only a general concept. There is a difference between the two. If we look at survival and happiness separately, although they both have indisputable importance to humanity, they are not equally important. Obviously, survival comes first and happiness comes second.

One: Human Survival Trumps All Else

The meaning of survival is often defined in a very broad way. For example, sometimes bettering the quality of life is included in the context of survival, or survival can be equated with living. However, the survival we speak of here refers only to the existence of life—that is, to be alive. It is the more literal sense of the word "survival." As members of the human race, we obviously stand on our own human perspective when inspecting and evaluating things. We pursue happiness, pleasure, health, conscience, and morality, but the beneficiary of all these pursuits are humans. Without life, no such pursuits would exist. People toil for life every day; farmers work in the field from dawn to dusk, workers manufacture products at all hours. Without life, they would not be able to accomplish any of this, and without life, they would not gain anything in return. Our scholars and politicians worry about the problems in society. They discuss and plan for

environmental issues, resource shortages, and peace maneuvers. All of these carefully designed economic, cultural, and social constructions are carried out based on humanity. Without humans, none of these arrangements would have subjects to act on. These arrangements also rely on humans to complete them; without human existence, there would be no one to discuss, plan, and arrange things. Thus, we say that survival trumps all else. Survival is the number one, unparalleled human value. Nothing exists without survival.

Survival is also the number one instinct of mankind. When a person encounters harsh challenges, their desire to survive can propel them to do previously unimaginable things. A weak person can hold up things of incredible weight; a disabled person can suddenly stand. Countless real-life examples prove that when it comes to life and death, survival can make the most of a person's potential and create remarkable miracles. This upholds the argument that survival is the most important human value.

The pursuit of survival can be extended from human individuals to human groups, or even all humanity. No matter if it is a country, a nation, a group like an organization, or the whole of mankind, self-survival always remains the goal above all else. If self-survival cannot be guaranteed, all other pursuits are empty. The carrier of all human pursuits is the survival of mankind itself.

Two: Happiness—the Eternal Human Pursuit

Happiness is an eternal human pursuit; that is a universal, fundamental truth. Happiness is the purpose of life; all human life is spent in the pursuit of happiness. Defining happiness is much more difficult than defining survival. What is happiness? How is it obtained? In people's minds, these questions are often vague and confused. Everyone is pursuing happiness, and everyone wants to be happy, but few people clearly understand what they are pursuing in life. Even fewer people manage to hold on to that choice and maintain it relentlessly.

Happiness should be described as an emotion, a satisfaction, and peace of mind. Those with money, status, and honors may not necessarily be happy, while someone who is penniless could very well have happiness. The psychedelic pleasure brought on by drugs is not true happiness, but the mother who bears the pain of childbirth is truly happy. The reason for all this lies in the satisfaction and peace of the mind.

Happiness comes from hope; one cannot be happy without hope. If today is an improvement upon the day before, and tomorrow is expected to be even better than today, the soul will be happy and satisfied. Contrarily, if life deteriorates day by day, happiness will be elusive. Happiness is especially present in the comparative sense of hope. If living standards have been increasing quickly for the past decade, a sudden slowing down of such increase would interrupt peace of mind. Although today would still be better than yesterday, the increase rate has slowed down compared to before, making it hard to feel as happy as before. The same conditions may bring

different levels of happiness under different circumstances. If your daily standard of living was ten dollars ten years ago, you might have been happy. But if your daily standard of living was still ten dollars ten years later in the exact same living environment, not only would you not be happy, but you might be very pained and disappointed. That is because ten years ago your life was good compared to those around you, but after ten years, everyone else's living condition has improved with only you left behind, thus destroying your peace of mind.

True wealth is the absence of greed, so happiness is dependent upon satisfaction of the soul. Greedy people cannot be satisfied even with mountains of gold, while content people are happy with just bread and water. The reason the rich are not necessarily happy is that they wish for even more wealth. The poor may be able to obtain happiness if they have less lofty pursuits . . . perhaps basic food and clothing may suffice. A person's happiness is largely determined by their desires; the easier it is to achieve such desires, the easier it will be to feel happy, and the opposite applies as well.

It may help to understand happiness by examining the psychological changes Chinese people have gone through in the past forty years. Forty years ago, we were in the Mao era. The entire country was poor, and in our isolated state we did not know the situation abroad, so we thought that was how the world should be. Therefore, people often found happiness even in their impoverished state. After China's reform, the nation's economy developed rapidly. As the overall standard of living improved, the gap between rich and poor widened as well, and the community became increasingly restless. Those who lagged behind development-wise were often unhappy and disappointed, even though their lives had improved. All they could see was that their neighbors had just replaced their bikes with cars when they themselves had just bought bikes; and their neighbors had upgraded their dwellings from fifty-square meters to one-hundred-square meters to one hundred-andfifty- square meters, but they themselves had just moved into a one-hundredsquare meter room.

Hence, peace of mind is produced in comparison. This comparison can be with the surrounding population and environment, with our own past, or with our desires. If an entrepreneur who had originally planned for the company's earnings to reach ten million this year only achieved five million, he would certainly not be happy. But if he objectively analyzed his business at the beginning of the year and set the profit target at one million, he would undoubtedly be happy with a five million figure. With the same five million profits and the same entrepreneur, the feelings of happiness can be completely different. This is due to the change in satisfaction one experiences through comparison.

We often lament that happiness is cheap . . . so cheap that even a penniless man can experience it. But happiness also costs dearly, so much so that even billionaires cannot afford it. To be happy we must also feel secure. If we existed in constant terror over war and murder, it would be difficult to feel happy. A stable, peaceful society, on the other hand, provides better conditions for happiness. Happiness is not entirely dependent on the amount of wealth one possesses, but it does require some economic support. One who lives barely clothed, constantly hungry, and always cold can hardly feel happy. Happiness also depends on healthiness of body, as it is hard to feel happy when

constantly suffering from illness. Happiness is inseparable from joy and pleasure, but they are not one and the same. Joy and pleasure are natural experiences, while happiness is the combination of natural experiences and reflections of the soul. Engaging in sexual activities with someone you do not love may produce a temporary pleasure, but it will not produce happiness; enjoying the stimulation of drugs and alcohol may be somewhat joyful, but not necessarily happy.

Happiness goes hand in hand with suffering. Without experiencing pain, one cannot understand true happiness, just as one who has never failed cannot understand the joys of victory. Only those who have suffered the destruction of war can truly understand the beauty of peace.

Suffering is happiness' mirror. Only those who have suffered in the past cherish and find satisfaction in the present. The suffering of others can also be a mirror into one's own happiness, for the suffering of others can reflect the happiness we possess. Happiness is continuously gained through an eternal pursuit. There is no absolute happiness, just as there is no eternal happiness. Life always has imperfections; there cannot be perfection without such imperfections.

Happiness is influenced by one's outlook on life. Different life views produce different feelings of happiness. Terrorists see the killing of innocent civilians in retaliation against their political opponents as a kind of happiness; war maniacs view conquering the world, killing, and plundering from others as happiness; a noble person gains happiness from contributing to others; loving parents find happiness in caring for their children and watching them grow up happy and healthy; devoted children find happiness in caring for their elders.

Because of this, the pursuit of happiness can be guided. The ethical and moral aspects of life value are dictated by social history. Different times and cultural backgrounds form different life values and different views of happiness. In history, we can often see noble people sacrifice boldly for their ideals and feel deeply happy doing so. These ideals are a type of life value; they can dictate people's feelings of happiness.

We can break down life pursuits into detailed and specific components such as food, clothing, residence, travel, wealth, status, achievements, familial affection, love, friendship, health, environment, and morality. At a cursory glance, satisfying any of the above pursuits can make some people feel happy while failing to do so for others. Just as one person can feel happiness from enjoying a good meal, another might only feel slightly happy from it, or no happiness at all. When measuring from the standpoint of all humanity, all of the above can be included in the scope of happiness, but none of them can be equated to happiness. Happiness includes all the above components, yet it is not the result of all of the above combined. It should be said that the pursuit of any abovementioned component is only one small portion of the happiness map.

A person can have any number of pursuits, but only by pursuing their main goal in life and achieving correspondingly can they experience happiness. Achievements in all other pursuits can only produce joy, pleasure, or other similar emotions. For example, if a woman saw a happy family as the primary goal in her life, she would feel happy once she reaches this goal; perhaps buying an unflattering set of clothing might frustrate her sometimes, but it would not change the

satisfaction and peace of mind deep within her. If a man deemed a successful career as the number one goal in his life, he may experience joy from a glass of good wine, but it would not be able to undo the sense of disappointment and misfortune brought on by professional failure.

The main goals in life can be adjusted and changed. For example, a woman who fails in the pursuit of a happy family may turn towards a successful career, and a man who fails in his pursuit of business may change his focus to a happy family. Similarly, the main goal of a person's life before the age of thirty may be a high degree of education from university or a PhD, but after age thirty, one may adjust their life's goal to more specific areas like business or politics. Once this person enters old age, their life focus may change to health and family harmony. No matter the type of goal, as long as it is the main goal during that stage of life, its pursuit may produce happiness or unhappiness, depending on the situation.

Further expanding the concept of happiness from individual to group and even all of humanity, the same goals exist and can be adjusted accordingly as well. A nation may wish to be respected by other nations, and a country may want to dominate the world. To them, respect can produce national pride, and world domination can acquire additional wealth. If this nation or this country cannot achieve their goals, they may turn to simpler goals like peaceful coexistence, or not being invaded or occupied by other countries. Therefore, from the perspective and interests of all mankind, we cannot only consider whether humans can survive and reproduce endlessly, but we must also consider whether our generation and future generations can exist in peace and prosperity. Whether on an individual level, a group level, or the level of all mankind, the pursuit of happiness is eternal and innate.

SECTION TWO: THE VALUE OF SOCIAL SYSTEMS

The realization of human values depends not only on natural factors, but also on social systems. "Social systems" as discussed here is a broad term refer-ring to all social conditions related to the operation of human society. In addition to the basic governing systems we usually refer to, various other mechanisms, rules, and behaviors such as social patterns, social structures, political systems, legal systems, moral values, codes of conduct, economic and culture policies, and so on are also included. The value of social systems refers to the social conditions that must be ensured in order to safeguard the orderly operation of human society.

We have established that survival and happiness are the highest of human values, and we also know that survival and happiness are the basic pursuits of humanity, yet we often find that many people chose to die in the face of life and death; many people chose pain instead of happiness. These people are completely willing in their choice as they experience no regrets, and future generations respect and admire them for their actions. Such phenomena occur because humans rely on a set of social values when making choices in their own pursuits.

Soldiers on the battlefield charge fearlessly to their death, sacrificing their own lives in defense of their countries. In dire situations, parents would rather end their lives to ensure the survival and

happiness of their children. It is faith and emotion that helps people to overcome the fear of death and to sacrifice their highest value—that is, survival—for the benefit of others.

A wife may give up her beloved career to take care of her family and support her husband's work. An elder brother may willingly give up valuable education opportunities and start work early to support his younger brother through school. Such stories of sacrifice are abundant, for some of us measure choices against other criteria—the criteria of social values.

This does not mean that survival and happiness are not important, nor does it negate that survival and happiness are the highest values of humanity. The truth is just the opposite. Life is most precious for everyone, and anyone who lives desires happiness above all. It is only certain specific conditions of human society that require someone to sacrifice their own survival or happiness for something, or some things. If this cannot be done, human society will lose its procedures of operation, and humans themselves will lose faith in their existence. It is through a long history of development that human society finally established its own social systems.

It is necessary to restrict the values of mankind with social systems. Imagine two climbers trapped on the top of a mountain in a snowstorm with limited food. One climber might kill the other and take his food to survive. In a few days, once the snow stops, this climber might be rescued while his teammate dies. Actions like these base the survival of self upon the death of others. Hitler invaded and occupied many other countries, killing millions of Jews in the process, just to pursue better living conditions for the Germans. This is basing self-fulfillment and happiness upon the suffering and death of others.

Every individual and every group seeks to secure their own survival and ensure their own dreams of happiness. However, the pursuit of survival and happiness must be through proper means, and all aspects of social operation should follow certain rules. If everyone used despicable means to obtain survival and happiness without considering others, the world would be filled with fraud, bloodshed, and terror, and human society would lose all rules and procedure. This would inevitably lead to total chaos; humans as a whole would no longer have a chance for survival and happiness.

Therefore, it is necessary to use a series of social systems to serve and maintain human values. Only by limiting certain people from obtaining values through unjust means and guiding everyone to live, learn, and work along certain rules, and maintaining interaction between groups, can human society's orderly operation be ensured—and, along with it, the realization of universal human values.

One: The Maximum Value Principle

Social systems in all aspects of human society are established under certain conditions. There will always be corresponding social systems as long as there is human society. Take social forms, for example. Human society transitioned from the earliest migrant gathering period to settled villages, then to the tribal stage, and finally to the national stage that continues until this day. The evolution

of social forms was to adapt better to humans' ever-expanding needs in agricultural production and the enlarging scope of war. In another example, countries have each established their own different political, economic, and cultural systems and defined them in legal terms in order to regulate individual behavior and ensure the stability of society. From a much smaller perspective, every city, street, community, and country has its own set of management models. They each promote a set of lifestyles or codes of conduct appropriate to the community. All of these are within the category of social systems.

The most essential function of social systems is to serve people; it is either consciously or unconsciously formed by prevailing local circumstances, or specifically designed and promoted by a certain power. Because social systems have to regulate and mandate all aspects of society, some of them will restrict and limit the realization of certain human values. However, this restriction only exists to ensure the realization of other major human values. The state enacts laws against homicide, theft, and robbery; this undoubtedly limits the wrongful acts of the lawless, but it is precisely this legal protection that allows the vast majority of people to live peacefully in a safe environment. Such legal systems are social systems that guarantee the values of the majority by limiting the values of a smaller group.

To cite another example, a city may develop rules forbidding littering and spitting in public to ensure the cleanliness of the city. This social system would also limit the behavior of a small number of people, but it would be to protect the clean-living environment of all city dwellers. In other words, it is limiting some less important values for a small group of people to realize the more important values of the whole city.

There are some social systems that limit the values of the majority to serve the values of a small number of people, such as when authoritarian kings demand frequent tributes of treasure, fruit, and beautiful women from all over the country. This is also a type of social system, implemented by the mandatory power of feudal dynasties.

There are also some social systems that fully serve the public and affect no one's values. For instance, the city government may establish a mayoral service hotline to solve the problems people encounter every day. This type of social system generally only has beneficiaries, and no person's interests are harmed in the process.

Social systems pertain to all facets of human society; they involve the values of every individual and group. Each person and group will evaluate a social system from their own point of view. How should we define the quality of a social system? What characteristics should an ideal social system have?

Social systems exist to serve human beings. Since different individuals and groups from different generations have differing or even contradictory needs, no one group or generation of people can objectively evaluate a social system. It is argued here that social systems should be established with all of humanity in mind so that the values of mankind as a whole can be maximized. In other words, the whole of humanity should be considered in these systems instead of just individuals,

singular groups, or specific generations. Survival, happiness, and other human values should be guaranteed for as many people as possible. This is the fundamental principle that social systems should be built upon. We refer to it here as the "maximum value" principle.

The maximum value principle does not change with the development of society, nor does it alter according to the passage of time. Perhaps one day all the issues discussed in this book will be outdated, but the maximum value principle will not become obsolete. The maximum value principle is the core principle that governs all the research in this book.

As human beings, when we think about ourselves and plan for our future, we obviously hope that all arrangements are aligned as much as possible with our own interests. The problem is that the interests of mankind are multi-faceted—there are many types of values to pursue. The acts of mankind and the multitude of designs we implement for the future of humanity cannot fully satisfy all the values of every individual, group, and generation. A plan that satisfies certain values may be in conflict with other values; when the values of a certain group of people are satisfied, the values of other parts of the population may be damaged. This is completely normal; nothing can be 100 percent perfect, and no plan can be flawless. Loss and gain go hand in hand; this contradiction will apply to the design and evaluation of any social system. The solution to this contradiction lies in the maximum value principle; the good of the majority outweighs the good of the few, and the actions that cause least harm win out.

As we know, the two most important human values are first, survival, and second, happiness. Relative to these two, all other values are subservient. If we look at value systems through such direct lenses, it is easy to manage them. Any issue related to survival comes first, any issue pertaining to happiness comes second, and all other values follow accordingly. Yet if one really dealt with problems this way, it would cause certain chaos. For example, conflicts and contradictions between individuals and countries often exist, and if one simply emphasized the survival and happiness of one party, the other party's survival and happiness would inevitably be negatively affected. When facing a variety of complex value choices, how would we practically implement the maximum value principle?

1. Happiness Defers to Survival

When considering human values, we will separate humanity into four levels: all humans, human groups, human individuals, and intergenerational humans. "All humans" (or humanity) refers to the whole of mankind and all peoples from all generations; "human groups" includes all manners of assemblies (like countries, nations, businesses, etc.) and non-organized groups; "human individuals" denotes singular individuals or small minorities; and "intergenerational humans" refers to people from different generations.

When we say that "happiness defers to survival," we mean that when the survival and happiness of humans on a similar scale are in conflict, we must consider survival first and happiness second. This is very simple logic. Since survival outranks happiness when dealing with the same amount

of people, happiness must give way to survival during any conflict between the two. The survival of people is more important than the happiness of that same amount of people.

It follows that we cannot deprive ten people of their lives to ensure the happiness of ten other people. On the contrary, if ten people must sacrifice their happiness in exchange for the lives of ten others, that would be a worthwhile exchange of values. According to this principle of deference, anyone who kills another in order to seize their property and wealth is defying the principle of happiness defers to survival. Since the acquisition of wealth is only one category of happiness (not even the whole scope), while life is the entirety of survival, exchanging one for the other is comparatively unreasonable. Of course, this is just a simple value analysis. It does not take into account social factors. The killing and robbing of others is in itself an immoral behavior. If such behavior were allowed to spread in human society, it would inescapably lead to upset, thus affecting the survival and happiness of humans on an even larger scale.

Take another example: if a person was terminally ill and in need of $200,000 to cover medical expenses, would he be justified in robbing someone else and using the “survival trumps happiness” rule to defend his actions? Certainly not. If we simply considered one person’s survival and another person’s money as belonging respectively to the scope of survival and happiness, this value exchange would certainly seem worth it. However, if robbery or other forms of forced possession are utilized, adverse results would occur. Such adverse results would lead to social instability, and many people’s survival and happiness would be threatened. The question boils down to a choice between one person’s survival and the survival and happiness of many people, and the latter obviously outweighs the former. If one person willingly donated $200,000 in savings to save another person’s life, the meaning would be completely different.

The value principles determined here are designed precisely to consider the concept of comprehensive influence. All other value principles discussed in the following take this concept into consideration as well.

2. The Majority Rule

The majority rule stipulates that in terms of survival, happiness, and other values, when assessing within the same value category, the values of the majority are deemed most important. In other words, if the lives of ten people had to be exchanged for the lives of twenty, the value exchange would be meaningful; along the same vein, if the happiness of ten people had to be sacrificed to ensure the happiness of twenty others, that value exchange would also be worthwhile. If the situation were to be reversed, it would not correspond to the maximum value principle.

It is important to note that the majority rule compares different numbers of people within the same value component on things of similar import. The rule cannot be applied if the value component is different—that is to say, the survival of ten people cannot be compared to the happiness of twenty others, and a certain portion of the happiness of ten people cannot be compared to another portion of happiness for fifteen others.

3. Assessments Must Be Flexible

It is obvious that both the happiness defers to survival principle and the majority rule are ideal codes that deal with simple situations. In simple situations, the assessment of values is clear at a glance. A person's life is obviously more important than a person's happiness; two people's happiness is obviously more important than that of one, and two people's lives obviously outweigh one person's life. This type of simple value assessment is indeed easily defined.

When it comes to actual problems, the situation will often be far from simple. We will find that we must compare ten people's lives to the happiness of a thousand others, or parts of ten people's happiness must be compared with other parts of ten other people's happiness. These problems complicate the situation; under such conditions, flexibility becomes the key.

For example, the progress of science and technology brought the advent of cars and aircraft as means of transportation, and they can quickly send people across great distances. A car's one-hour journey on the highway takes days to walk, and the one-hour flight time of a plane equals weeks of journeying by foot. The use of these vehicles makes people's lives more convenient, relaxed, and efficient; these attributes are all within the scope of happiness. However, the emergence of cars and airplanes also means the appearance of car accidents and plane crashes. People die every day due to car or aircraft accidents. In terms of human values, loss of life is within the scope of survival. If we use the principle of happiness defers to survival as our reasoning, all cars and planes should be destroyed. This conclusion is clearly ridiculous, as the use of cars and aircraft facilitates all of mankind and brings great happiness to humanity. In comparison, car accidents and plane crashes occur relatively infrequently, meaning they pose minimal threat to the survival of humans. When the potential for great happiness conflicts with miniscule threat to survival, happiness ranks first.

Perhaps a group of people needs to be diverted to build a reservoir. These people have lived here for generations, and removing them from their homes would be very inconvenient. They would also have difficulty adapting to a new environment and building a new life. The building of the reservoir would also require a great amount of capital; however, the successful completion of the reservoir could solve many people's agricultural irrigation problems. For the migrants, moving would be inconvenient, thus making it part of the happiness value. The investment of capital would be a loss in the happiness category as well. For the beneficiaries, the gain would be a rich crop, which would bring a better quality of life, which also fits within the happiness category. These different aspects of happiness cannot be simply compared, so one would have to employ some flexible thinking when deciding whether or not to build this reservoir. Perhaps under certain investments situations, moving one hundred people could only solve irrigation problems for one thousand farmers, in which case it would not be worthwhile to build the reservoir. On the other hand, if moving one hundred people could solve ten thousand people's irrigation problems, the reservoir would be necessary.

Based on the above judgments, we can draw two clear conclusions: First, the survival of mankind is the highest of all values. Since survival is the number one value, and humanity as a whole

outweighs all else in magnitude, the survival of all humanity outweighs everything else. All other values must exist secondary to the survival of mankind. This conclusion informs us that in all problems involving humans, the survival of the species is the most important problem (the focus of this book is on solving this problem as well). In the face of overall human survival, all other values can be sacrificed. Any action that threatens the survival of humanity just to guarantee other values is contrary to the maximum value principle.

The second conclusion is that within the value of happiness, the happiness of all people outranks all other values of happiness. Inside the happiness value, humanity occupies the largest share in quantity. According to the majority rule, universal happiness is most important (this is the other issue this book deals with). No individual, group, or generation can threaten the universal happiness of humanity for their own happiness, as that would contradict the maximum value principle.

The two above conclusions will be the two fundamental bases that guide this book's research. These two conclusions seem easy to understand and obviously correct, but it is very difficult to consistently and constantly follow them. In the subsequent analysis, we will discover that we have done and are still doing things that threaten the overall values of humanity, and that these actions sometimes seriously endanger the overall survival of mankind. Judging based on the maximum value principle, such actions are clearly big mistakes; they are most unforgivable crimes and also extremely dangerous behavior.

Two: Justice

To achieve the maximum value principle, social systems must first be just. Justice is the value of social systems; it is the actual embodiment of the maximum value principle within a social system. If the maximum value principle establishes the standards and goals for social systems, justice is the means and path to achieve such goals.

As the value of social systems, justice includes two meanings: fairness and reason. This so-called fairness basically means impartiality and equality. The vast world encompasses countless beings, billions of human individuals, countless different human groups (such as different countries, different nationalities, different enterprises, different institutions, etc.), and peoples of all generations. Justice requires equal and impartial rights for all human individuals, groups, and generations. Any individual, group, or person from any generation should have the right to equally obtain respective values. This not only requires all individuals, groups, and intergenerational peoples to refrain from depriving others to ensure personal gain, but to be equal and impartial in the distribution of assets and interests.

The reason we say the maximum value principle requires fairness before all is because some people will inevitably occupy more interests in an unjust society; therefore, other people will enjoy less interest, and these people's values will be impaired. This is only the beginning. Those who seize more interests will definitely be those who control dominant power and resources; they obtain more interests because they have the ability and conditions to do so. Due to the nature of

mankind, such abilities and conditions will lead these people to focus even more social interests in favor of themselves. The final result will be that a minority of people enjoy the majority of interests, and they will only accumulate more interests as time goes by. At the same time, the number of people who profit less will grow while the portion of interest they can share in will shrink more and more. Therefore, the ultimate outcome of an unjust society is that the value of most people cannot be achieved, and this obviously does not meet the maximum value principle.

An unjust social system will also propel a very small number of people to seize value from others through immoral means (such as murder, robbery, etc.) in order to ensure personal gain. This would unsettle the entire society, and the vast majority of people would suffer. It would obviously be contradictory to the maximum value principle.

The significance of fairness also lies in the universal pursuit of happiness. Happiness is a product of comparison; only in a just, equal society could the majority of people attain happiness through comparison. The so-called reason means that social systems must consider the characteristics of humans and human society—as well as human adaptation to natural conditions—in order to exist scientifically and realistically.

For example, historians generally believe contemporary humans to be less happy than ancient humans. Today's world is far more just and equal com-pared to ancient times; the material wealth produced by current technology also far outweighs what has been created in the past. Under these conditions, humans today are less happy than those before us. This obviously means that there are seriously unreasonable factors in our current social system. It is the unreasonable factors in our social system that lead to a reduction in overall human happiness.

It seems that fairness alone cannot guarantee the realization of the maximum value principle, just as humans' survival could not be ensured in a fair society that was plagued by war. And if people were constantly under various types of competitive pressures, the heavy psychological burden would rob them of joy, thus negating their happiness. A just social system that can realize the maximum value principle must not only be equal and fair, but also a combination of science, realism, justice, and reason.

Enlightenment thinkers proposed the slogan of "freedom, equality, and universal love." This slogan guided human society from superstition and ignorance to civilization. Taken literally, "equality" and "universal love" refer to fairness, while "freedom" refers to reason. This informs us that human society cannot be just "fair" and "universally loving," but must also ensure freedom.

A fully just social system's reason factor denotes much more than just freedom. Many other aspects must be realized to ensure the maximum value principle. In today's world, most people experience more freedom than before under the ideals of freedom, equality, and universal love, yet they do not experience as much happiness; the highly educated class of today has far more freedom consciousness compared to villagers in remote areas, yet due to the higher level of psychological pressure, they also feel less happy.

All this shows that the reason factor in social systems includes far more than just freedom.

The organic combination of fairness and reason is the key to establishing a harmonious and stable society of justice. The downfall of many regimes in human history resulted from the lack of a good relationship between fairness and reason. For example, the wealth of one affluent group (such as a family) might be accumulated through the efforts of many generations. It would be reasonably acquired. However, if the entire society were suffering in poverty, the wealth of minorities would seem incredibly unfair. Most of the uprisings, rebellions, and social unrest in history happened under the slogan of equalizing wealth and bridging divide. There is an old saying in China: "Poverty is not a problem . . . imbalance is." If a regime wishes to ensure long-term stability, reason is not enough. Fairness must also be safeguarded.

On the other hand, if too much emphasis was put on fairness, and reason was ignored in the process, new problems would arise. If the reasonable wealth of the elite class was excessively deprived, it would damage their productivity and enthusiasm, the overall prosperity of the society would fall, and a general state of poverty might occur. Mao Zedong Era China and today's North Korea are all such cases.

When conducting an in-depth analysis on the justice of social systems, we can divide justice into four aspects for discussion: individual justice, group justice, intergenerational justice, and overall justice. The moral values of society encourage people to give up important personal values and exchange their own survival and happiness for that of others under specific conditions. It also opposes the establishment of personal survival and happiness upon the death and suffering of others. This is all within the scope of individual justice. We propose that everyone is equal before the law; every citizen has the right to vote and be voted for, and everyone is assigned benefits according to how much they contribute. These are all in the range of individual justice.

We oppose strong countries, nations, and religious groups who bully weaker ones; we condemn groups who invade, pillage, and commit murder against other countries, nations, or religious groups for personal gain. We advocate for equality and neighborliness between countries and nations; we encourage wealthier countries to support poorer countries, and developed areas to help undeveloped areas. All this is in the scope of group justice. We advocate for fair trade between enterprises and oppose monopoly as well as trade protectionism. This also belongs within group justice.

We oppose the uncontrolled exploitation of non-renewable resources to circumvent resource depletion; we protest excessive grazing, over-cultivation, and deforestation to prevent desertification; we are against the large-scale emission of greenhouse gases to avert global warming; and we contest the use of Freon in order to preserve the ozone layer from damage. We take these pre-cautions to leave clear waters and blue skies for the future generation and to ensure sustainable development for human society. This is within the scope of intergenerational justice.

Whether it is individual justice, group justice, or intergenerational justice, they all revolve around the theme of "fairness." They deal with relationships between individuals, groups, and people of

different generations. In addition to this, human society must also balance its overall fairness. In other words, some things that may not seem fair from a partial view would be fair to the whole society, because the overall interests of mankind sometimes require the sacrifice of partial interests—just as the maximum value principle requires the few to obey the majority (the majority rule). This issue belongs in the category of overall justice.

The overall value of human society, however, may not always be able to be realized at maximum, just as some fair principles may not bring universal survival security and happiness. That is due to the unreasonable factors within such social systems. Within the context of justice, certain parts are devoted to considering rationality based on the whole of mankind. The purpose of such consideration is to realize as many values as possible for all human beings. This is also within the scope of overall justice. Overall justice requires smaller interests to serve larger interests; it opposes the placement of individual interests before group interests, and group interests before overall interests. Nevertheless, we often see countries putting their own interests above global interests while the international community remains helpless to stop them. This is caused by the unreasonableness of social systems.

Looking at the current world from another perspective, we find that human society today is fiercely competitive. People are under constant pres-sure to update knowledge and under constant threat from competition failure. Depression becomes common and the suicide rate climbs continuously. Generally speaking, while people have obtained a level of material enjoyment, they have not obtained similar levels of happiness; instead, they are burdened by heavy mental stress. This is a cause of unreasonable social systems.

Overall justice also considers things based on humans as a species. It deals with the relationship between mankind and other species, as well as the relationship between nature and man. As human beings, we should develop principles of justice from our own point of view. That is why we propose that the overall survival of mankind exists above all else. Any factor that could possibly endanger our survival must be mercilessly eliminated. Perhaps these factors involve the survival of other species, or other issues, but every other problem becomes insignificant in the face of human survival as a whole. Because we are humanity, we cannot sacrifice our entire existence to achieve some sort of morality. Once morality leaves its bearer, it will have no more purpose.

Similarly, for humans as a whole, we cannot sacrifice our universal happiness for the survival of other species, nor can we sacrifice our own happiness as a species to ensure the happiness of other species. The justice principles we formulate must serve the survival, happiness, and other values of humanity; they should maximize the achievement of universal human values. This is both logical and reasonable.

Judging according to the principle of overall justice, Americans like eating beef, Arabs love mutton, the Chinese people like eating pork, and Koreans love dog meat. This dietary issue does not pertain to human survival, since humanity can survive on grains and vegetables. Yet humans require delicious food, and this demand is within the category of human happiness—in other

words, the demand for meat satisfies some of the needs for human happiness. And so humans slaughter large numbers of other animals every day, exchanging their lives for our own happy appetites. Relative to other species, humans are immoral. But based on humanity as a whole, the justice principle must serve human values, making this immoral exchange understandable.

The justice principle has also put forth requirements for humans accordingly. We object to the torture of animals, the devastation of rare species, the destruction of the earth, and the pollution of space. In reality, not only do such requirements not conflict with humanity's happiness and survival, but they fundamentally help humans achieve their values. A caring group can better promote world peace and harmony, a bio-diverse world can better achieve natural unity, and a beautiful earth and clean space is more conducive to human life and guarantees better long-term survival and happiness for future generations of mankind.

Finally, it is necessary to note that there is no affiliation or mutually inclusive relationship between individual justice, group justice, intergenerational justice, and overall justice. They are different social system requirements put forth by different factors from different perspectives.

SECTION THREE:THE FAR-REACHING PRINCIPLE

This book is devoted to the far-reaching, universal, and fundamental interests of mankind. It considers the fate and future of mankind. In order to explore corresponding issues in depth and propose solutions, we will start our research from a more extraordinary point of view. This research approach can be summed up in one term: the far-reaching principle. This principle has two characteristics: first, it seeks to be as broad as possible in its expanse; second, it strives to be as enduring as possible in terms of time.

One: A Broad Expanse

Humans live on Earth as terrestrial creatures, but even with the simplest experience we can determine that the fate and future of man is not influenced by isolated land factors alone. Without evaporation from the ocean there would not be enough rain, without plate movement there would be no mountains or rivers, and without the atmosphere humans could not breathe. This is all intuitive information. To interpret the fate and future of mankind, we cannot limit our focus to the land, as the entire globe, as well as the atmosphere around it, is essentially linked to the fate and future of humanity.

Even the elements listed above are not the whole picture. For example, the magnetic field above Earth's atmosphere prevents cosmic rays and solar winds from attacking us, and beyond Earth's magnetic field lies the solar magnetic field, which influences humans constantly as well. These are all things that cannot be directly observed by the naked eye, but they objectively exist. Therefore, we should expand the scope of research as well.

We all know that Earth is just an extremely small planet in the vast universe, yet the vast universe constantly affects the small Earth we live on as well as its inhabitants. Looking to the

solar system, the moon affects the tides of Earth every day; solar flares explode many times every year, influencing us in many ways; asteroids and comets experience large collisions with Earth every few centuries. Looking out to the larger Milky Way, and even the entire universe, the possibility of alien invasion, the impact of supernova eruptions on Earth, and the possible threats posed by black holes are all issues closely related to the fate of mankind.

Perhaps we are overthinking some things, as some of these elements are much too far away from us, and their potential impact seems unfounded as of yet. However, if we do extend and broaden the expanse of our vision, how can we eliminate the factors not worth considering and capture the elements that really do pose a threat to mankind?

Two: An Endurance of Time

We know that human beings have only entered civilized society for less than tens of thousands of years, but the earliest concept of man formed about four million years ago when the Australopithecus first separated man from primates by standing up. If we take into account the original human breeding process, the earliest life on Earth can be traced back to 4.28 billion years ago. So how far into the future should we look when considering the fate of mankind?

Today's world is growing at a rapid pace. The Industrial Revolution greatly stimulated the creativity of science and technology; as a result, our world is constantly changing every day. From this standpoint, it is enough to set human future research goals to ten years or a hundred years, since we cannot possibly know what the world may be like in ten or a hundred years. The changes to the world after such periods of time will most definitely be drastic, so perhaps that is the only thing we can accurately predict.

From the future view of humans as a species, we can almost be certain that although we entered the threshold of humanity some four million years ago, humans should not be extinct in four million years. Humans are the strongest of all Earth's creatures; we are complex life-forms that are the most capable of adapting to the environment in the entire history of Earth's biology.

So how far away should we cast our net? Since this research focuses on the future of humanity on a far-reaching, universal, and fundamental level, ten or a hundred years is much too short a scale. Should we set our eyes on four million years later? A billion years later? Or even further off? The book's foothold is the latter.

What must be noted is that the billion-year goal just acts as a mirror in order to reflect current issues. Realistically speaking, things happening in mil- lions, hundreds of millions, and billions of years are only predictable, and no accurate judgments can be made. On the contrary, many things that might come in a decade or century cannot be predicted or grasped. In particular, it is important to emphasize that everything we do today is affecting the world of the future in increasingly serious ways.

At the end of the nineteenth century, people exclaimed that more had been done in the one hundred years of the nineteenth century than since the birth of humans; at the turn of the twentieth century, people exclaimed once again that the century had accomplished more than all else previously accumulated, including the one hundred years of the nineteenth century and all human history before that. This undoubtedly tells us that humanity's ability to transform themselves and nature is growing a hundredfold, a thousand fold, and more. Perhaps one act of wrongdoing today could not be made up for with even a hundred years of effort in the future... it could even be irreversible. If we do not use a billion-year goal as a mirror, we cannot scientifically plan for today and tomorrow. Without such a far-reaching mirror, we cannot truly realize the long-term, universal, and fundamental interests of humanity, correct our mistakes in a timely manner, and maintain our path on the right direction for years to come.

Using billions of years as our research scale does not mean our focus is on what we should do in a billion years—that is a research topic better left to the future generations. Although the expanse of this research goes to the very edges of the universe, it is not focused on journeying into the depth of the universe to accomplish something either, as such a goal would be quite meaningless. On the contrary, our entire purpose is to use a time period of billions of years and a spatial scope of tens of billions of light-years as an investigation scope and reference target. This will guide our actions for today and the near future, making sure that everything we do is in line with the long-term, global, and fundamental interests of humanity.

Therefore, the far-reaching principle is actually based in reality. It is just a research method that seeks to make our research considerations more pro- found, comprehensive, and meticulous. It is still intent on solving issues of mankind today and in the near future. Although such a principle may inconvenience our research, it can make our research conclusions more objective and scientific.

Chapter Three External Threats

With the research methods and principles determined in the previous chapter, we can now carry out substantive research. The first thing we must study here is the largest problem humanity is facing, as well as the large problems we may face soon.

The two factors that act upon human beings are external and internal. This chapter focuses on the external elements that may threaten or influence human beings.

SECTION ONE: THREATS FROM THE UNIVERSE

When we stand on Earth and look towards the towering mountains, mighty rivers, and magnificent oceans, we are often amazed by the mightiness of our planet. However, from the perspective of the universe, the earth is miniscule. It is only one small member within the sun's stellar system. Its mass is three-hundred-and-forty-thousandth of the solar system, and it is completely subject to the sun's control.

In the vast universe, the role of the sun is much smaller compared to that of the earth within its star system. As a star system, the solar system is two-hundred-billionth of the entire Milky Way, and the Milky Way only occupies three-hundred-billionth of the universe. The solar system is nothing more than a drop of water or a speck of dust within the vastness of the universe.

When considering threats to mankind from the universe, we will first consider humans and the earth together, since humans cannot survive without the earth. Then we will consider the earth and sun together, since the earth is subject to the sun and will be influenced by it, thus influencing humans as well. Lastly, we will consider the solar system as one point, since that is what it signifies within the universe at large.

One: Gravity and Star History

There is one force in nature that cannot be obstructed by any object or distance, and that is the gravitational force between substances. Humans have weight while standing on Earth because the earth has gravitational pull on humans. That gravitational force is equal to one's weight; the moon orbits the earth without fail because the earth's gravity attracts the moon; similarly, the earth orbits the sun due to the sun's gravitational pull. The sun rotates around the center of the Milky Way due to the Milky Way's gravitational force.

Gravity was first discovered when Isaac Newton observed apples falling from the tree instead of flying to the sky. In our daily life, many natural phenomena are caused by gravity. The rise and fall of ocean tides are caused by the gravity of the sun and moon. The sun's gravity not only acts

on the side of the earth facing it, but the other side is affected by the sun's gravity as well. Two planets tens of thousands of light-years apart have gravity between them as well.

In addition to gravity, there are three other forces in the natural world: electromagnetic force, and the strong and weak forces wit hin the nucleus. The strong force is the strongest among the four natural forces, but it only acts w ithin the nucleus. The second strongest force is electromagnetic force; it is only one- hundredth ti mes the strength of strong force, but its scope is much larger. It is electromagnetic force that stop s nuclei from touching and prevents the strong force from being released. In addition, the release of the strong force is dependent on neutrons; weak force is the force that causes protons to decay into neutrons, making it a necessary aid in the release of strong force. Gravitational force is he weakest force in nature; it is millions of billions of times weaker than electromagnetic force, a nd weaker still than strong force. However, gravitational force is not subject to restraint from any sort of distance or object. It is omnipresent and all encompassing, allowing its weaknesses to unite into incredible power, overcoming all other forces to rule our universe.

A star is a planet that produces heat and light through the use of nuclear energy. Nuclear energy is produced when a planet is large enough to exert gravitational force on its core temperature until it reaches more than ten million degrees. When this happens, the hydrogen nuclei that make up the star will produce violent movement, eventually breaking through the exclusion of electromagnetic force and colliding with each other, resulting in nuclear fusion and the release of strong force.

The nuclear fusion of hydrogen is a process that combines four hydrogen atoms into one helium atom; 0.7 percent of its mass is lost in the process. That is the cost of releasing nuclear strong force; a very small amount of loss in mass can produce huge amounts of energy. For other stars similar in size to our sun, nuclear fusion occurs twice: once as hydrogen fusion, and once as helium fusion.

When hydrogen fusion produces light and heat, the helium it produces is deposited into the core of the star. Once large amounts of hydrogen become helium through fusion, the hydrogen levels at the star's core will be exhausted with mainly helium atoms left, but hydrogen will continue to burn outside the star's core. Two forces will occur at the same time in the star's core: one is the gravitational force of the star, and the other is the expansion pressure caused by hydrogen fusion outside the core. When the combined strength of these two forces causes the core's temperature to reach one hundred million degrees, the helium nuclei will break through the electromagnetic force and collide, resulting in helium fusion and strong force release.

When helium burns, it transforms into oxygen and carbon, and since it releases even more energy than hydrogen fusion, it will be as if another star ignited within the star's interior. This inner star will force the outer star to expand, making the star's diameter a hundred times bigger, and its volume a million times larger. The new star will be very large, but its surface temperature

will be lower than the original star's surface temperature, and it will appear red in color; it is called a red giant.

Helium fusion does not last as long as hydrogen fusion. During the later stages of helium fusion t he star will enter an unstable state. The material in the star's periphery will be thrown out, while the core—composed mainly of carbon and oxygen—will collapse into a highly dense, very hot white dwarf star.

White dwarfs are dead stars, and although they have a high temperature, that temperature is just remnant heat from the original star. No more thermonuclear reactions can take place within this star. After tens of billions of years of slow cooling, it will become an ice-cold planet. According to human standards, white dwarfs are priceless materials. The materials inside it are arranged in a lattice-like structure, just like the structure of a diamond; sadly, this huge diamond would be difficult to obtain.

Since hydrogen fusion is more stable and lasting in comparison to other fusions, the hydrogen fusion stage is known as the main star sequence of a star in astronomy. The time a star stays in the main star sequence decreases rapidly as its mass grows. A star like the sun stays in the main star sequence for about ten billion years; however, a star 0.3 times the mass of the sun burns for thousands of billions of years, while a star five times the mass of the sun only burns for tens of millions of years. This is because a star will have stronger gravitational force the larger its mass. This gravitational force will speed up the internal nuclear fusion speed of the star. Once the star's mass reaches a certain extent, the extreme violence of nuclear fusions will destabilize the star, causing it to explode. That is why stars cannot be infinitely large. So far, the largest star we have observed is the R136α1 star; its mass is about three hundred times that of the sun.

A star's mass cannot be too small, either. The smallest star will generally not be less than 8 percent of the sun's mass, because a star would not have sufficient gravitational force to ignite hydrogen atoms and create nuclear fusion if it were too sm all. If it cannot produce light and heat, it cannot be called a star.

The final fate of a star is largely determined by its mass. A star with mass less than 0.7 times that of the sun will not have strong enough gravity; it will only burn hydrogen. Its helium will never be ignited. A star with mass 0.7–8 times that of the sun would share in the sun's fate. Within this mass interval, smaller stars will burn hydrogen first and helium later, while larger stars will also burn carbon. After these stars cease to burn, they will quietly evolve into white dwarves.

A star whose mass is greater than eight to ten times that of the sun will explode violently after its star death. Once a star has mass eight to ten times the mass of the sun, the great force of gravity within it will continue to ignite other elements after hydrogen, helium, and carbon are exhausted. These other elements in order are: oxygen, neon, silicon, and iron. Every time a new heavy element is ignited, another inner star with even bigger energy will be produced, continuously enlarging the outer star from within until its diameter reaches tens of billions of kilometers. When this ignition process reaches the element iron, iron's nuclear combustion not only releases

energy, but it also absorbs energy. Once the star's interior loses the support of energy, a catastrophic result occurs. This star that had reached tens of billions of kilometers in diameter will suddenly collapses towards its center, causing an extremely violent explosion. The material of the star will be tossed hundreds of billions of kilometers away. This explosion is known as a supernova.

When a supernova occurs, the core of a star will be brutally compressed, and electrons will be pressed into protons. Since electrons are negatively charged and electrons are positively charged, this compression of electron into protons will cancel out the positive and negative charges, producing neutrons. The newly formed neutron star will be extremely dense; it can reach up to hundreds of millions of tons per cubic centimeter in density.

Neutron stars have very strong magnetic fields; they are 108 to 1,015 times stronger than that of Earth, and they rotate very quickly, reaching up to several hundred rotations every second. Neutron stars can emit strong electromagnetic waves (light) through its two magnetic poles. Since a neutron star's magnetic axis and its axis of rotation does not coincide, the electromagnetic waves it emits during rotation will circulate space regularly; this is the lighthouse effect of the neutron star. A neutron star's lighthouse effect can indicate direction in space. The many spacecrafts we send into the universe carrying information to aliens are directed by the position of neutron stars.

When a star with even bigger mass explodes, the violent collapse will crush the nuclei within it, forming an even more compact and dense celestial object—so dense that even light cannot escape its gravity. This is the black hole. The existence of black holes in the universe has already been confirmed.

Two: Black Hole Swallowing

When we stand on earth and throw an object towards the sky, this object will eventually fall back to the ground because Earth's gravity is acting on it. Without Earth's gravitational force, this object will fly out into space in the same direction it was thrown, never to return. Even though the Earth has gravity, once the speed of the thrown object reaches a certain extent, it will escape Earth's gravitational force and travel forward ceaselessly. This speed is called the escape velocity. The escape velocity of Earth's surface is 11.2 kilo- meters per second. In other words, when we throw an object towards space at a speed of 11.2 kilometers per second from Earth, this object will no longer fall back to the ground but fly into space. Escape velocity is different on the surface of different planets. The escape velocity of the sun is 617 kilometers per second; the escape velocity of the moon's surface is 2.38 kilometers per second. The escape velocity of the sun's surface is much bigger than that of the earth's, because the sun's gravitational force is larger than that of Earth's. The moon's surface escape velocity is smaller because the moon's gravity is smaller than Earth's gravity.

Light has the fastest speed in nature; it can travel three hundred thousand kilometers per second. When a planet's gravity is exceedingly large and its surface escape velocity reaches the speed of light, it becomes a black hole. Even light cannot escape from a black hole. If the earth were compressed into a little ball one centimeter in radius, tinier even than a ping-pong ball, it would become a black hole. Black holes are not rare in the universe. Could our solar system fall into one such a black hole? If that were to happen, it would undoubtedly be the end of mankind.

The largest black hole in the Milky Way lies in the Galactic Center. Let us first analyze the threat this black hole poses to us. We know that the sun rotates around the Galactic Center once every 250 million years. Since the sun has been formed for five billion years, it should have rotated thus twenty times. From what we observe today, there is no indication of irregularity in the rotation of the solar system. The black hole in the center of the Milky Way swallows the planets within the Galactic Center; in order for other stars to be swallowed, they must first enter this range. The solar system is located relatively far from the Galactic

Center on the outer edge of the Milky Way; it is 270,000 light-years away from the Galactic Center. While rotating around the Galactic Center, as long as the sun does not change its trajectory drastically, it should not reach the Galactic Center within the next tens of billions of years. In order for the sun's trajectory to change drastically, a planet equivalent in size to the sun would have to collide with it. If such a collision took place, the devastation of humanity would not be caused by black hole swallowing, but by this collision instead.

From another point of view, this also illustrates that the sun will not be swallowed by the Galactic Center black hole until its star death. The universe has a history of 12.8 billion years; scientists generally believe that the Milky Way formed not long after the formation of the universe, though the specific numbers differ. The European Southern Observatory (ESO) estimates the Milky Way to have formed 13.6 billion years ago and the Galactic Center's black hole to have a mass about 2.6 million times that of the sun. The Milky Way's mass totals about two hundred billion times the mass of the sun, which means that the black hole at the Galactic Center swallowed eighty thousandth of the stars in the Milky Way in 13.6 billion years. With this speed, it would take about a trillion years for the entire Milky Way to be swallowed. The sun will only remain in its main star sequence for five billion more years, so there is no need to worry about being swallowed by the Galactic Center black hole.

In addition to the black hole at the Galactic Center, would there be any other black holes that could swallow the sun? Apart from the Galactic Center, black holes are also likely to appear in the heart of globular star clusters. As a globular cluster will have tens of thousands to millions of stars clustered in a relatively small concentrated area, its center is likely to produce a black hole. Of course, such black holes would be much smaller than the black hole in the center of the Milky Way; it would only be hundreds of thousands of times the mass of the sun. At present, astronomers have observed X-rays emitting from the center of some globular clusters; this is evidence that black holes do indeed exist within globular clusters.

There are about five hundred globular clusters in the Milky Way, but they are all far away from us. The brightest globular cluster we can see is the Centaurus. It has about one million stars and is sixteen thousand light- years away from us. The globular cluster nearest to us is M4; it has about one hundred thousand stars and is 7,200 light-years away from us, which of course is a very safe distance.

Apart from the black hole in the Galactic Center and the ones in the centers of globular clusters, other black holes formed through the death of larger independent stars also exist. Astronomers have already observed such black holes in the universe, but they are all very far away from us. The most famous among them is the Cygnus X-1. This is a black hole relatively close to us at 10,000 light-years away from the solar system. To date, the nearest black hole observed from us is located in Sagittarius; it forms a binary system with an ordinary star numbered V4641SGR. This black hole is 1,200 light-years away from the solar system. Both 10,000 and 1,600 light-years are a safe enough distance away, as neither could affect the safety of the solar system.

In fact, a medium-sized black hole poses about the same threat to the solar system as a star. At best, a black hole will have a slightly larger threat range, but since the distance between stars is so great, such a range is almost negligible. At the same time, stars large enough to form black holes are few and far between in the universe. Only about one in ten thousand stars has the ability to form a black hole. The possibility of the sun encountering a black hole is only one-ten-thousandth that of it encountering stellar collision.

Three: Stars, Rogue Planet Collision, and Supernovas

1. Stars and Rogue Planet Collision

Today's universe is the domain of stars. Stars not only occupy a great proportion of the universe, but they are also readily visible. The sun is a star, and we humans rely on its glory to survive. There are hundreds of billions of stars in the Milky Way. Could the sun collide with or be seriously disturbed by one such star, causing the overall ecological destruction of Earth and the extinction of humanity?

Let us first analyze the regional environment in which the solar system is located. The solar system is located on the outer edge of the Milky Way; the planet concentration in this area is much sparser compared to the Galactic Center and galactic nucleus. The star nearest to the solar system is the Alpha Centauri, a triple star system consisting of three stars. Within the Alpha Centauri, the Alpha Centauri C is closer to us at 4.25 light-years; it is thus also known as the Proxima Centauri. A little farther away from us than the Alpha Centauri is the Barnard's Star, 5.96 light-years away, and the Wolf 359, 7.8 light-years away. All other stars are more than eight light-years away from us, and only seven-star systems exist within ten light-years of us. According to our observation of the Alpha Centauri, it is currently approaching us at a slightly

fixed angle and will reach a minimum distance of three light-years from us in many years before moving away again.

Regarding the possibility of stellar collision, this set of data can best illustrate the situation: if we shrink the 139.2 kilometer in diameter sun into a small speck of sand one mm in diameter, the star nearest to us would be29.2 kilometers away, and the average star distance to us would be fifty-two kilometers, making the chance of collision very minimal.

More importantly, the little specks of "sand" sparsely distributed in the three-dimensional space are not randomly arranged and rocketing around; they are moving very slowly in regular patterns. Take the star's operation as an example: this grain of sand only moves 4.92 meters every year. On top of that, all stars are orbiting the Galactic Center on their own trajectories without exception. They respect each other and follow a strict order. In the universe, the larger in mass a celestial object is, the more regular it is and the less likely it will be disturbed by external forces. A celestial object on the level of a star rarely changes trajectory; the gravitational force of the Galactic Center is one of the only forces strong enough to act on it. For a star like the sun that exists in the sparsely populated edge of the galaxy, stellar collision and stellar disturbance are both extremely unlikely to occur, even once in hundreds of billions of years.

There are also some planets in the universe that do not emit heat or light; they are not affiliated to stars or star systems and thus cannot be counted as ordinary planets. These planets only exist because they were too small when they first formed, so they were only able to ignite the hydrogen atoms in their center. These planets can only form independent systems rotating around their own centers; we may call them rogue planets. Are they likely to collide with the sun or cause disturbances?

Because the number of naturally formed small objects will always be higher than the number of naturally formed large objects in the universe, rogue planets will outnumber stars. Such planets may likely exist around the solar system; they are merely undiscovered. However, the number of such planets will still be quite small. If we apply the previous metaphor, the danger of one such planet colliding with or seriously disturbing the sun is similar to the addition of two or three slow-moving, even smaller specks of sand within a range dozens of kilometers in radius.

Moreover, rogue planets move along a set trajectory just like stars; they are also ruled by the gravitational force of the Milky Way's center and orbit the Galactic Center in an orderly manner. Rogue planets each have their own orbit, and the disturbance among them is minimal... thus the possibility of collision between these sparsely distributed sand specks is even smaller. In fact, even if two galaxies merged, the possibility of collision—even in the center intersection area where planets are most concentrated—would be small at less than one in a hundred billionth. This is because relative to the size of stars, the distance between stars is much too big.

Some people will ask: If the possibility of celestial body collision is so small, why do we still observe such occurrences happening? Celestial body collision or interference generally only happens in three situations: one is within the center of a star system; the second is within the

center of a star cluster; and the third is between companion stars. The center area of any star system will have the most material and star concentration. From the very beginning of a star system's formation, a gravitational center will occur and attract as much material as possible, creating a center in the star system. At the same time, once a star system is formed, material and celestial bodies close to the center area will be pulled towards the center due to gravitational force. However, the attraction of celestial bodies toward the center of the galaxy happens very slowly. For peripheral stars like our solar system, this will not be an issue for at least hundreds of billions of years.

The same holds true for star clusters. During the formation of star systems, certain areas with higher density formed star clusters where tens of thousands or millions of stars cluster in one small space. Star clusters must have their own centers as well; this center will have an even higher concentration of stars and material, so the possibility of stellar collision will be greater. Fortunately, our solar system is far from any star cluster and will not join their crowded ranks.

Many stars in the universe are binary or triple stars, meaning they are two or three stars wound closely together. In systems like this, due to gravity, any star will have great influence on its companions and will also be greatly influenced by their companions. That is why such companion systems are often very unstable. Our solar system is obviously not one such star system.

2. Supernovas

Supernovas are the most violent eruptions known to happen in the stellar world, increasing the brightness of the star tens of thousands or even hundreds of millions of times in a very short time. Stellar material is thrown out at a rate of up to ten thousand kilometers per second, and the powerful radiation can strongly affect a very large area. In terms of threats in the universe, the threat of supernovas is far larger than that of stellar and rogue planet collision or disturbance, and even more so than that of black holes. Supernovas are the threats that really should be paid attention to in the universe.

There are two types of supernovas, type I and type II. Type I supernovas are the result of closely orbiting binary stars. The principle is this: if two stars are grouped closely together in a binary system and one is larger in mass, the larger star will evolve into a denser white dwarf star first while the other star is still burning. Since stars are gas planets that have flow, the white dwarf star will attract material from its neighbor with its gravitational force, forming a layer of hydrogen around the white dwarf star. Once this hydrogen layer builds to a certain extent, its temperature will rise to a great height under the white dwarf's gravity. Once that temperature reached ten million degrees, the hydrogen nuclei will ignite and nuclear fusion will occur. If the white dwarf star accretes enough material from its companion star, helium fusion will occur after the hydrogen fusion, and carbon fusion will also follow. Since a white dwarf is mainly composed of carbon, carbon fusion will not ignite in the external layer, but rather in the center of the star. Carbon fusion will spread from the center towards the outer edges of the star, culminating in a huge explosion that will throw the crushed remnants of the white dwarf star and all its peripheral material into

space. Type II supernovas are stellar explosion of large stars after they evolve into their later period; we have already discussed this.

It is estimated that a supernova occurs every twenty-five to seventy-five years in the Milky Way, but few are ever observed because the solar system is located on the galactic disk and is blocked by other stars and interstellar material when observing the Milky Way.

Supernovas can threaten humans in two ways. On the one hand, when a supernova happens, its thermal radiation will raise the earth's temperature, damaging the planet's ecological balance. So far, humans have observed seven supernovas in the Milky Way, but they all occurred far away from us. The nearest supernova happened in 1006, and it was 4,006 light-years away, thus posing no threat to us at that time. However, close-up supernovas would be a different situation altogether. According to our calculations, if a supernova were to explode where the Alpha Centauri is located close by us, it would be like an additional sun one-sixth the size of the actual sun, appearing atop Earth for a month and a half; the earth's average temperature would rise four to five degrees.

On the other hand, a supernova can harm us through the radiation emitted by gamma rays and other harmful rays. This problem is much more serious than thermal radiation because the strong gamma rays and other harmful rays emitted by a supernova can threaten life within a very wide range. According to a specialized study conducted by NASA Goddard Space Flight Center's astrophysicist Neil Grace and his colleagues, only a supernova occurring within twenty-five light-years of space could weaken the ozone layer enough to double Earth's surface UV, thus seriously affecting the survival of mankind.

To sum up, the supernovas we must beware of are the ones within a twenty-five-light-year range of us. According to astronomical observations, there are no stars capable of producing supernovas within this range. The conditions for supernovas are fairly obvious. A type I supernova requires a pair of closely orbiting medium large stars, and a type II supernova requires a star with mass more than eight times larger than the sun. Stars like this are very easy to discover at close range, and there are no such stars nearby.

Even though there is no possibility for a supernova occurrence close to the solar system today, the sun itself is not static. It rotates the Galactic Center at 220 kilometers per second. The other stars that orbit near the sun's trajectory follow a certain pattern as well, so we may line up with a supernova within twenty-five light-years in the near future. Scientists have calculated that a supernova takes place within one hundred light-years of us every 750 million years. According to this projection, a supernova will happen within twenty-five light-years of us every forty-eight billion years. Our sun has only been formed for five billion years and will become a red giant in another five billion years. Humans will no longer be able to survive on Earth at that time; thus, such occurrences pose minimal endangerment to us.

Even if we do catch up with a supernova, there is nothing to fear. There are obvious signs before a supernova happens, and these signs will provide us with at least one million years of preparation time. Once we observe the possibility of a supernova in our vicinity, we will have

ample time to take a series of effective precautions. In extreme circumstances, we can develop measures to discharge large amounts of ozone into the atmosphere in order to counteract the destruction of the ozone layer; we can develop anti-UV radiation skin care products and radiation-resistant clothing to protect from strong ultraviolet radiation; we can stay in radiation-proof buildings or air- raid shelters during the first twenty days of the most intense gamma ray radiation; and the few people who must work outdoors can wear radiation- proof space suits. If the supernova were even closer, we would also have to prevent against thermal radiation. The sea level would rise due to melting glaciers, so we would have to move some coastal residents; we would also have to take appropriate precautions against epidemics that may occur from floods and frequent hurricanes. In short, such encounters would be extremely troublesome but would not pose a threat to the overall survival of humanity.

Four: The Threat of Micro Black Holes and Antimatter Planets

Today's understanding of the universe is based on quantum mechanics and general relativity, both of which have only been established for a century, so our understanding of the universe cannot reflect the essence of the universe. According to analysis based on existing cosmological theory, there are two types of celestial bodies whose existence remains unproven. If they do exist, the threat they pose to the solar system and humanity would be devastating. They are micro black holes and antimatter planets.

1. The Threat of Micro Black Holes

According to the Big Bang theory, after the initial explosion, enormous pressure may have compressed material in different areas into small black holes. These black holes range from tens of thousands of kilograms to the size of small stars. We call them micro black holes or quantum mechanical black holes.

If such micro black holes existed, what kind of situation would they be in after 13.8 billion years? According to the laws of nature, the smaller, more irregularly formed objects are more likely to exist in great numbers, and vice versa. The same rule should apply to the micro black holes form ed in the Big Bang. Most would be small in size with very few ones reaching the size of the moo n or Earth. How would these micro black holes threaten us? To answer that question, we must fir st understand some of the characteristics of black holes. Even though black holes swallow even light, they are not completely insulated. Black holes also evaporate, and the smaller a black hole is, the faster it evaporates. Larger black holes evaporate slower. The evaporation period of a black hole the mass of the Milky Way is 10100 years (one hundred zeros after 1); the evaporation period of a black hole with mass equivalent to the sun is 1065 years. Such large black holes take very long time to evaporate, perhaps longer than the universe would exist. However, a one-billion-ton black hole would only need ten billion years to evaporate; a one-million-ton black hole would only need ten years; and a one-ton black hole would evaporate in 10-10 seconds—less than a blink of an eye.

Considering that a black hole will swallow at least some material in the process of its existence, people generally use one billion tons as the mass divider line. It is generally believed that black holes with less mass than this have already evaporated, while black holes larger than one billion tons still exist. This mass is roughly equivalent to that of a large mountain.

The vast majority of black holes formed by the Big Bang were very small; few would have surpassed one billion tons in mass; thus, most black holes should have evaporated in the past 13.8 billion years. The opposite would apply to the larger micro black holes; they evaporated very slowly to begin with and constantly swallowed material close to them, making them larger and larger and more difficult to evaporate. If such black holes lived until this day, their mass should be even larger than they were 13.8 billion years ago.

The distribution density of micro black holes should be roughly the same as other material in the universe; as ancient celestial objects, they would most likely be concentrated in the centers of star systems if they still existed today. At the same time, if the estimates concerning micro black holes are correct, the Milky Way would have such micro black holes as well, and the majority of them would be concentrated in the center of the Milky Way. The micro black holes in the center of the Milky Way are far away from the sun and will not endanger its safety, but other micro black holes will exist in other parts of the Milky Way. Could these micro black holes threaten the safety of the solar system?

Let us use a micro black hole with mass equivalent to the moon colliding with the sun as an example. A micro black hole whose mass equals the moon is already fairly large, but it would only be about 0.1 millimeters in size—about as big as a speck of barely recognizable sand. If a celestial body the size of the moon collided with the sun, there would first be an earth-shattering impact and then the moon would be swallowed by the sun. However, the situation would be completely different if a micro black hole equivalent in mass to the moon but only sand sized collided with the sun. When a speck of sand so small has a great deal of mass, its kinetic energy will be very large as long as a certain degree of speed is reached. Since the cross section of this speck of sand is so small, it will receive little resistance and easily penetrate the sun from one side and emerge from the other, continuing on into space. The micro black hole will not evaporate but will instead absorb some of the sun’s mass and radiate some of its own energy, thus increasing its own mass. Since the absorption capacity of such a micro black hole is limited, the sun will continue burning like nothing happened.

If this speck of sand moved very slowly and stayed inside after penetrating the sun due to gravity and resistance, something else would happen. In this situation, the micro black hole would slowly absorb the sun’s material into itself and increase continuously in mass while the sun’s mass decreased. At first no change would be seen on the surface of the sun, but after millions of years of absorption the nuclear fusion system inside the sun would be completely destroyed, and the sun would fall into the micro black hole. Next this micro black hole would become a black hole with mass equivalent to that of the sun. The earth and all other planets would continue to rotate around this celestial body. Since the sun’s light and heat would no longer exist,

the temperature on Earth's surface would drop quickly and Earth would become an uninhabitable freezing world.

Of course, a micro black hole may also directly impact with Earth, and it would create conditions similar to that of a micro black hole colliding with the sun. The micro black hole would either penetrate through the earth or stay inside and slowly absorb the planet until the earth fell into the black hole.

The threat of micro black holes should be considered in two cases: one treats the existence of micro black holes as a hypothesis, and the other will analyze the authenticity of micro black hole existence. If we assume that micro black holes do exist, after 13.8 billion years of evaporation, the possibility of us meeting one of the few surviving larger micro black holes cannot exceed one in a hundred billion. Even if there were an encounter, three results might occur. In the first case, the micro black hole would go through the sun with no lasting damage; in the second case, it would penetrate into the sun and absorb its material until the sun collapsed and was destroyed. Both of these results have been illustrated already.

In the third case, the micro black hole might be captured by the gravity of the sun and become a member of the solar system family. Micro black holes are smaller than the sun, so if they enter the sun's gravitational range at a certain speed (as long as they do not collide with the sun), it would be perfectly natural that they be captured instead.

In the above three possibilities, the third possibility is the greatest. It takes great precision to collide with the sun, while being captured only requires entering of the gravitational range. The first possibility is probably the second most likely to occur, since the relative velocity between one celestial body relative to that of another is generally high, especially under strong gravitational pull; the second possibility is least likely because the probability of one celestial body slowly colliding into another celestial body is too small. In the above three possibilities, the second one is the only one that poses a real threat to the sun, which means that the threat of micro black holes is pretty insignificant.

Now let us examine the authenticity of micro black holes existing. According to a theory by the famous scientist Stephen Hawking, micro black holes are widely present in the universe. If this were the case, there would have to be situations in which micro black holes swallowed stars. There are trillions of stars in the universe, so if micro black holes were ubiquitous, it would be impossible for there to be no stars swallowed by them. It follows that there would be sudden collapses of stars accompanied by the emission of X-rays. If micro black holes existed around us, they would swallow objects and emit X-rays as well. In all our observations of the vast universe, we have never found traces indicating the existence of micro black holes.

2. The Threat of Antimatter Planets

Antimatter is inferred from Big Bang cosmology. We know that the basic unit that forms matter is the atom, which consists of the nucleus and electrons. The nucleus is composed of protons and

neutrons. Electrons are negatively charged, protons are positively charged, and neutrons are not charged. The water we drink is actually water molecules composed of two hydrogen atoms and one oxygen atom, and the salt we eat is actually sodium chloride molecules composed of one sodium atom and one chloride atom. Everything we see and feel is made of matter; countless electrons, protons, neutrons, and the atoms and molecules they compose are present in the universe.

According to Big Bang cosmology principles, when the Big Bang formed matter in the universe, it should have also formed the same amount of anti- matter. The so-called antimatter includes the positively charged antielectron corresponding to the negatively charged electron, the negatively charged anti- proton corresponding to the positively charged proton, and the antineutron that is still not charged but has all the opposite properties of the neutron. The antielectron, antiproton, and antineutron combine to form anti-atoms, which in turn form anti-molecules, thus forming the world of antimatter.

Scientists obtained antielectrons, antiprotons, and antineutrons early on in the laboratory, but they are annihilated when they come into contact with matter and release energy and gamma rays. If the sun were to meet a sun-sized antimatter planet, it would become a huge fireball and strong gamma rays before disappearing to become energy floating in the universe. Therefore, if the sun ever met a large antimatter object, the result would be catastrophic for humans.

If, judging by Big Bang cosmology, antimatter did exist in the universe in roughly equal amount to matter, the universe would be filled with anti- matter. This would mean that antimatter planets would inevitable encounter material planets and be annihilated. But what is the actual situation?

Over the years, scientists have devoted much effort to the search of anti- matter. In 1979, American scientists placed a balloon roughly sixty stories high, thirty-five kilometers above ground, and managed to capture twenty- eight antiprotons, which is a very small amount. Later, the Chinese-American scientist Ding Zhaozhong (Samuel Chao Chung Ting) organized a space study that captured a small number of antiprotons as well. Antimatter particles have also been obtained in scientific laboratories. A number of studies have shown that large antimatter does not exist in the universe; there are no antimatter celestial bodies within thirty million light-years. That means that there will be no antimatter celestials in our Milky Way, or even in the Local Group. The study principle of scientists is not difficult to understand. Let us take the determination of the sun's matter/antimatter status as an example. Solar winds are constantly blowing over Earth; the main component of solar wind is protons. If the sun were antimatter, all the protons it produced would be antiprotons instead of just a few antiprotons (this number of antiprotons could not light a 100-watt light bulb for one billionth of a second through annihilation), and the earth would be annihilated by these antiprotons. As that is not the case, we can positively confirm that the sun is composed of matter instead of antimatter.

The same method can be applied to the Milky Way and the Local Group. In the Milky Way and neighboring galaxies, cosmic rays fly everywhere in particle form without annihilating any celestial bodies, thus demonstrating that there is no large antimatter in our Milky Way or in the

Local Group. However, we do not have enough basis for judgment when it comes to farther galaxies. Today's astronomical observations can only receive light from distant celestial objects; matter radiates photons, so antimatter would radiate anti-photons. Since photons are neutral, anti-photons are actually the same particles as photons, making it impossible to distinguish with current technology whether distant celestial objects are made of matter or antimatter. Of course, celestial objects also radiate neutrinos; neutrinos radiated by matter and antimatter will certainly not be the same. Interaction between neutrinos and any other material is always weak, so neutrinos radiated by the sun can penetrate through Earth with minimal damage, making it difficult to design a device capable of receiving them.

In conclusion, it does not matter for the time being whether there are large numbers of antimatter celestial objects in the distance, just the fact that no such objects exist within thirty million light-years of the solar system is enough to placate us. Even if antimatter celestial bodies did exist over thirty million light-years away, it would take tens of billions of years for them to collide with the sun, and the sun will have long ceased existing by then.

Five: The End of the Universe

The end of the universe would undoubtedly be the end of mankind as well; in fact, conditions for human survival would cease to exist long before the end of the universe. So how and when will the universe finally end?

Our universe is a rapidly expanding universe; its expansion is propelled by the Big Bang from 13.8 billion years ago; however, there is also a ubiquitous force in the universe that constrains its expansion, namely the gravitational attraction between matter. The strength of gravitational force depends on the mass of objects and the distance between objects.

Will the expansion force of the universe eventually overcome the gravitational pull between objects, or will gravitational pull between obj ects win out over the universe's expansion force? This will decide the ultimate fate of the univers e. f the expansion force of the universe outweighs the gravitational pull between matter, the universe will continue expanding. This is kn own as the open universe theory. On the other hand, if gravitational pull between cosmic matter wins out in the end, the universe's expansion will reach its maximum in several billion years bef ore contracting under the weight of gravity, ultimately returning to the starting point of the unive rse. This is the closed universe theory. The cosmic model established by the Big Bang only allow s for these two possible end results. Which one will be the ultimate end of the universe?

If we could accurately obtain the average density of matter in the universe, it would not difficult to determine this outcome. Unfortunately, apart from the visible matter that we do not fully understand, there are also large amounts of dark matter and dark energy that we know nothing

about in the universe. This makes it impossible to formulate a clear judgment on the end of the universe. Our discussion can only be divided into two assumptions.

The first assumption undertakes that our universe is an open universe, and the galaxies around us will continue to move away. In a few thousand million years, the only universe we see will be the thirty or so galaxies located in the Local Group. All other galaxies will have moved out of our line of sight, invisible even to the most advance observation tools. When that time comes, the universe we would observe would only be ten billionth that of what we see today.

The same would be true for the other galaxy clusters (groups). As independent celestial systems in the universe, galaxy clusters (groups) link their internal galaxies together while moving away from all other galaxies; eventually, all the other galaxies would be obscured.

Galaxy clusters (groups) are not static. The galaxies within them merge constantly to enlarge the galaxies, forming a series of super galaxies. Since stars rely on nuclear fusion to emit light and heat, once all hydrogen elements in the universe are exhausted, only brown dwarfs, neutron stars, and black holes will be left. These are all remnants of stars that have already died. Once this happens, the universe will end its Stellar Era and enter the Degenerate Era; this era will happen in hundreds of trillions of years.

The Degenerate Era will be much longer than the Stellar Era; it will last at least 1037 years. During this time, the remnants of dead stars will collide with each other, and black holes will swallow remaining celestial bodies and each other during collision, thus increasing the mass of black holes over time. After a period of 1037 years, the universe will enter the Black Hole Era.

The Black Hole Era will last even longer than the Degenerate Era and will be dominated by black hole evaporation. The bigger in mass a black hole is, the lower its surface temperature will be and the slower its evaporation will be. It is not possible to calculate how long the Black Hole Era will take; we have only one concept as reference. A black hole with mass equivalent to the sun will take 1065 years to evaporate, while a black hole whose mass equals the Milky Way will take 10100 years to evaporate. Once all black holes have evaporated, the universe will enter its last era, the Dark Era. At this time the universe will only have energy, and no more celestial bodies will be left.

If we take the second assumption and believe our universe to be a closed, it will reach its maximum after billions of years to stop expanding and start contracting instead. At this time, when we observe the galaxies from the Milky Way, they will no longer be moving away, but moving towards us instead. When this day comes is dependent on the energy and matter levels of the universe. At least from today's observation, the universe has shown no signs of stopping its expansion. Not only that, but according to observation in recent years, the universe shows signs of accelerating its expansion. This indicates that there still exists large amounts of dark matter and dark energy that we do not understand in the universe. We can extrapolate that the universe will not stop expanding in the next billion years, and that the possibility of the universe ending as an open universe is higher.

There is one thing we can be quite certain about: if the universe is a closed universe, its expansion and contraction will be essentially symmetrical; however long the universe took to expand, it will take the same time to contract.

When the contraction of the universe is 13.8 billion years away from its end point, the background radiation temperature of the universe should be roughly the same as today's, which is about three K; when it is one billion years away from its end point, background radiation should rise to thirty K, and galaxy clusters should start to merge; when it is one hundred million years from its end point, the universe's background radiation should reach three hundred K, which is higher than the average temperature of Earth today. Life will have difficulty surviving in the universe; after that, as the universe continues to expand and background radiation rises accordingly, the universe sky will brighten from the darkness it is today and turn a fiery red. When the universe is 300,000 years away from its end point, background radiation will reach three thousand K, and all atoms will disintegrate. Matter will exist in the form of nucleons, electrons, photons, and neutrinos; the sky will no longer be transparent after that. When the universe is one hour away from ending, its temperature will reach one hundred million K and be mainly composed of photons and neutrinos. Three minutes away from end point, the universe's temperature will reach one billion K and will be filled with electrons, neutrinos, and their anti-particles, with a small number of protons and neutrons; 10-4 seconds away from end point the universe will reach a temperature of one thousand billion K, and only protons, neutrons, and their anti-particles will be left; 10-35 seconds from end point, the universe's temperature will reach 1027 K, and the four natural forces will unite; 10-43 seconds from end point, the universe's temperature will reach 1032 K, and then the universe will shrink rapidly and reach its end.

Since the end of the universe is too distant a threat to mankind, discussing these issues right now has no direct implications. However, as one of the factors that affect humans' survival, the elaborating of it is necessary to comprehensively explain the problem.

While studying the universe, scientists found that the more we discover about the universe, the more unknowns we encounter. What is a singularity? What happens inside a black hole? What is dark matter? None of these questions can be answered by our current levels of research; however, the discussion in this section can clearly answer one thing: the universe will not bring catastrophic disaster to humanity in the next billion years. This conclusion is enough; that is the whole intention of this section.

SECTION TWO: THREATS FROM THE SOLAR SYSTEM

In the vast universe, the solar system only takes up one small corner. Nevertheless, it is the homeland of humans; the earth we live on is one small planet within the sun's star system.

Standing above the sun's north pole, we can see that all eight planets of the solar system rotate around the sun in the same counterclockwise direction. Their orbits almost align onto one plane, called the ecliptic. The orbit of the planets is described as oval, but in reality it is almost round.

The composition of these eight planets vary greatly, but they can be divide into two categories. The terrestrial planets—Mercury, Venus, Earth, and Mars—are solid planets composed of rock and metal. They are dense, they rotate slowly, and they have few satellites, similar to Earth. The Jovian planets—Jupiter, Saturn, Uranus, and Neptune—are bulky, heavy, low-density planets composed mainly of liquid hydrogen, liquid helium, and other substances. They wander space like "water balls," rotate fast, and have many satellites and rings.

The satellites of each planet are also important celestial bodies in the solar system. There are over 150 confirmed satellites in the solar system, and many more await confirmation. Although the earth is a relatively small planet, its satellite—the moon—is a large satellite, ranking fifth among the solar system satellites.

There are also many smaller celestial bodies in the solar system, such as dwarf planets, asteroids, comets, and meteoroids; they are too numerous to count. In addition, interstellar dust and interstellar rays are also components of the solar system.

As the third planet in the solar system, the earth is 150 million kilometers from the sun; the furthest planet, Neptune, is 3.5 billion kilometers away. That is far from the boundaries of the solar system. Dwarf planets (such as Pluto), many smaller celestial bodies, and interstellar material all exist beyond Neptune.

One: Threats from the Sun

1. The Sun Turns into a Red Giant

The sun's mass is 2×1030 kilograms; its diameter is 1.39 million kilometers, and it is composed of 71 percent hydrogen, 27 percent helium, and 2 percent carbon, oxygen, silicon, iron, and other elements. Humans' survival depends primarily on the sun; its light shines upon Earth and warms us. Without the sun's light and heat, the earth would be a cold, dead planet. If the sun went through any big change, it would be a catastrophe for Earth and mankind.

The sun relies on nuclear energy to emit light and heat; the energy it pro- duces every second is equivalent to that of twelve billion tons of coal. Earth only receives less than 2.2 billion of that light and heat, but it is enough to maintain the earth's ecology and turn it into a beautiful and pleasant planet. The energy source of the sun has always been a topic of concern to scientists.

Since ancient times, humans' experience with ignition has never strayed from the concept of chemical combustion. Whether it is coal, oil, or trees, burning has always been generated through the atomic shift of chemical energy. According to calculation s done with the highest combustion value fuels, if the sun continues to burn, it cannot last more t han thousands of years; the most optimistic estimates do not exceed hundreds of thousands of ye ars. On this basis, people have come to many erroneous conclusions, such as the belief that Earth's history as well as human and biological history are both significantly shorter than the ir actual length. The further inference from that views the future of mankind extremely pessimisti

cally. Since the sun's fate determines the fate of Earth and mankind, if the sun were to burn up in a few thousand years, humans would be extinct in a few thousand years as well.

However, the study of the earth's crust as well as the study of paleontology showed that both Earth and life on Earth have existed for far longer than people imagine. We also learned through astronomical observations that the actual history of stars was very different from past understandings, so people began to doubt the sun's energy source.

As early as the 1860s, scientists learned from optical analysis that the sun's main component was hydrogen. With the discovery of elemental radioactivity at the end of the nineteenth century, scientists recognized that there was a previously unknown energy in nature—nuclear energy. Significant breakthroughs in the understanding of nuclear energy followed quickly; in particular, Einstein's famous mass-energy equation theoretically proved the existence of nuclear energy, as well as the relationship between energy and mass. Further observations and studies show that the sun's internal energy is over ten million degrees, which means that in the extreme temperatures of the sun's core, the violent movement of the nuclei can break through the electromagnetic force. Scientists finally concluded that there was thermonuclear reaction happening inside the sun's interior and that the sun's light and heat were provided by nuclear energy. Moreover, the energy of other stars is also derived from nuclear energy.

Today, our understanding of the sun has reached a very high level, enough to ascertain the following: Our sun was born as a star about five billion years ago; its predecessor was a large hot air mass. We can confidently determine that this hot air mass was the remains of a second- or third-generation large star exploding in the universe. Through hundreds of millions of years of evolution, this hot air mass formed its own mass-intensive central area through gravity, then formed a primitive planet that continued to absorb the material around it through strong gravitational force, ultimately igniting the hydro- gen atoms at the core. This was the birth of the sun as a star.

The sun can burn hydrogen elements for about ten billion years; at present, it has burned five bill ion years with five billion more remaining. This is the stable and mild period of the sun; however, in five billion years, the helium atoms inside the sun will ignite and the sun will become a huge red giant. Helium will continue to burn for one billion years, but once helium is exhausted, the sun will quietly become a white dwarf. Although this white dwarf will have some remnant heat, there will be no nuclear combustion inside of it and it will naturally cool with time. Once the sun evolves into a red giant, the diameter of the new sun will be more than one hundred times that of the original sun, so it will quickly swallow Mercury, Venus, and eventually Earth. Once Earth ceases to exist, the homeland of humanity will disappear into the universe.

Standing on a billion-year perspective to consider the external forces that threaten the survival of mankind, the evolution of the sun into a red giant in five billion years is undoubtedly a threat. In fact, the sun will no longer be stable a few hundreds of millions of years before this. In this transition period, the Earth will suffer constant pressure from the sun.

When the sun evolves into a red giant, its flames will spread out. Not only will Earth be swallowed, but Mars will also become inhabitable. Humans will need to migrate even farther out. At this time, Jupiter or one or more of Saturn's satellites might be transformed into a place for human habitation, but the external environment will be abysmal.

Once the sun finally evolves into a white dwarf, it will no longer be possible for humans to survive in the solar system. Even though a hot white dwarf can radiate light and heat during its cooling process, its radiation energy will be extremely limited. Perhaps Mercury's position today would be close enough to enjoy such light and heat, but Mercury would have been swallowed when the sun turned into a red giant. Unless humans could move a planet closer to the white dwarf or live on an artificial celestial body, we would have to move out of the solar system. Moreover, white dwarf planets are not reliable long term, as they will slowly cool until all light and heat are completely lost.

Humans would not be able to survive in the solar system once the transition period began. During this period, the sun would be very unstable as it constantly underwent dramatic change, meaning that it would be impossible to accurately determine its movement pattern. One violent change would be enough to destroy humanity.

2. Threats from Solar Activity

Can we fully trust the sun in the billions of years before it becomes a red giant? Will it suddenly malfunction one day and greatly endanger humans? Do we really understand the sun and have a basis to say that there is no problem there?

The sun is a gas planet divided into the core, the radiation zone, the convection zone, and its atmosphere from the inside out. This atmosphere can be divided into the photosphere, the chromosphere, and the corona. These three layers are not cleanly divided but infiltrate each other. The sun's convection zone and what lies beneath cannot be directly seen through telescopes; their properties can only be determined through observational data and related theoretical calculations. The most direct impact the sun has on the earth comes from its surface activity; these solar phenomena mainly include sunspots, sun flares, prominences, and solar winds.

Even without the use of observational instruments we can observe that black spots appear frequently on the sun. These black spots are sunspots. Sunspots often exist in pairs and rotate around the sun from west to east in the same direction as solar rotation. They last a few days or as long as a few weeks from formation to disappearance. The central temperature of sunspots is about 4,500 K–1,200 K less than the surface of the photosphere, making them appear black in comparison. Sunspots are generally oval in shape; small sunspots are a few kilometers in diameter while larger ones can reach a diameter of tens of thousands of kilometers. Sometimes they appear in groups that span several hundred thousand kilometers. It is generally believed that the appearance of sunspots is a result of the sun's magnetic field. The activities of sunspots have

obvious cycles; sometimes they appear frequently, and other times they rarely occur. The average cycle is eleven years.

Solar flares are sudden flashes of increased brightness on the chromo- sphere; they are concentrated outbreaks of solar energy within a very short period of time. When a solar flare breaks out, it can throw out a large number of charged particles in a very short time, and it can accelerate solar winds a hundredfold.

Prominences are strong flows of hydrogen that burst out from the chr- mosphere. These bursts of hydrogen ignite into red flames and surge up hundreds of thousands of kilometers. It is generally believed that prominences are a result of sudden changes in the sun's magnetic field or are produced by the constant fluctuation of hydrogen flows. The activities of solar flares and prominences are closely related to the activity of sunspots; the movement of sunspots is considered to be the main sign in determining the strength of solar activity.

Earth's ecology is closely related to solar activity. When solar flares break out, strong solar winds interfere greatly with the earth's magnetic fields; these are known as magnetic storms. Shortwave communication on Earth relies on the ionosphere fifty or sixty kilometers above surface to reflect and disseminate information. Once magnetic storms occur, the ionosphere's degree of dissociation increases and electromagnetic waves are absorbed or fail to reflect normally, thus weakening the signal and interrupting short- wave communication.

Magnetic storms also affect the chemical structure and dynamics of the earth's upper atmosphere. Prolonged exposure to magnetic storms may greatly affect the earth's climate and cause floods or droughts. According to global climate analysis, the climate change cycle is twenty-two years, which is consistent with the sun's magnetic cycle. Solar activity is also associated with earthquakes. Through analysis of global seismicity cycles over the years, we have determined the earth's seismic cycle to be eleven years—completely consistent with sunspot activity cycles. Some scientists believe that the energy impact of solar winds on Earth increases during solar activity peak years, leading Earth's rock layer to discharge under pressure. In addition, the rock layer also stretches and vibrates under the alternating electromagnetic field, causing the rocks that had already accumulated tension to fracture and dislocate, leading to earthquakes.

In the study of old trees, we have learned that when solar activity is frequent, the growth rings of tress are wider, meaning they grow faster. Contrarily, in slower solar activity years, the growth rings of trees tend to be narrower, indicating slower growth. This confirms the impact of solar activity on Earth's biology. According to historical statistics, the growth of crops also conforms to this pattern.

Solar activity is also closely related to human health. For example, during solar activity, ultraviolet light is significantly enhanced, and the earth's magnetic field experiences strong disturbance, which can affect cardiovascular functions. During solar activity peak years, bacteria also breeds faster, causing the flu, diphtheria, and other epidemics to occur at higher rates.

According to Russian scientists, the biggest cholera pandemics in history generally took place during solar activity peak years.

While it is certain that solar activity influences the earth's ecology, and that the sun can both nurture and harm life on Earth, none of the above factors can endanger the overall survival of mankind. This conclusion is not deduced by decades or centuries of observation, nor is it summarized through thousands or tens of thousands of years' experience, but it is proven by five billion years of history. In the past five billion years, the sun has transformed the earth from a barren planet into a beautiful and pleasant planet. It woke the earth from its dead silence and enabled the first batch of life to be hatched 4.28 billion years ago; those were the simplest microbes. From then on, life evolved, continually basked in the glory of the sun, and never stopped until large complex life formed in the ocean 530 million years ago. Then, four hundred million years ago, life moved on land. Apes entered the threshold of man more than four million years ago, and humans completed their evolution nearly 100,000 years ago.

In five billion years the sun has never forsaken us, which is why we have every reason to believe that it will continue to nurture us for the next five billion years of its main star sequence. This conclusion can be confirmed by astronomical observations of other stars similar to the sun in the universe, and by existing scientific theories.

Two: Extraterrestrial Body Collision

In July of 1994, astronomy enthusiasts from all over the world witnessed the astronomical marvel through their telescopes of a comet colliding with Jupiter. While over Jupiter, comet Shoemaker-Levy 9 was torn into twenty- one pieces by Jupiter's huge gravitational force. These pieces crashed into Jupiter at a speed of sixty kilometers per second, exploding into a huge fireball and flashes of light while also producing a series of dark spots in Jupiter's atmosphere. The impact of such a collision is equivalent in strength to 100,000 nuclear bombs. If it happened on Earth, our entire ecology would suffer great damage, and humans' survival would be seriously threatened.

The 1994 Jupiter collision is not the largest impact Earth has suffered. Many people consider the extinction of Earth's dinosaurs 6,500 years ago to have been caused by an asteroid colliding with Earth. It is believed that an asteroid fifteen kilometers in diameter hit what is today Mexico's Yucatan Peninsula. Scientists have long been studying an impact pit buried deep under the Yucatan Peninsula; it is estimated to be 180 kilometers in diameter and 900 meters deep. If humans had lived in that era, we would have suffered a huge catastrophe. In fact, a large enough extraterrestrial body would be more than enough to destroy humanity. Therefore, we must study extraterrestrial body collisions in order to research the overall survival of mankind.

Within the solar system, celestial bodies that may collide with us include asteroids, comets, meteorites, and meteors. Since meteorites and meteors are too small to pose a threat to humans, we will only discuss the collision of asteroids and comets here.

1. Asteroid Collision

Asteroids revolve around the sun, just like Earth, but they are merely much smaller in size. There are many asteroids in the solar system, concentrated mainly in two areas. One is the vicinity of Pluto's Kuiper belt, and the other is the asteroid belt between Mars and Jupiter. As the Kuiper belt is far away from us, the asteroids there are not a threat to Earth. When studying the threat of asteroids, scientist generally do not consider the asteroids of the Kuiper belt.

The total number of asteroids in the solar system is estimated to be more than 500,000 (excluding the Kuiper belt and its outer asteroids). They are mostly small in size, and though they exist in great numbers, their total mass does not reach five ten thousandths that of Earth. Most of these asteroids are located on the asteroid belt in an area that measures roughly 2.17–3.64 astronomical units. (An astronomical unit refers to the distance between the earth and the sun; one astronomical unit is about 150 million kilometers.) The asteroids in the asteroid belt are very far away from us and generally do not pose a threat; however, due to their small size, light mass, and vulnerability to planetary influence, asteroids are highly probable to change trajectory, requiring us to give the distant asteroid belt considerable attention.

Many scientists believe that most of the asteroids in the solar system are concentrated between Mars and Jupiter because Jupiter's gravity attracted the asteroids originally located in the inner ring. Since Jupiter is the largest planet in the solar system, its gravity is much greater than the planets of the inner ring.

There are also a few very unique asteroids that have strayed from the asteroid belt and approached the inner orbit of Earth, while some others have progressed to the outer side of Saturn's orbit. Since these asteroids are very close to Earth, we call them near-Earth asteroids. These are the asteroids that truly concern us, as they pose a much bigger threat to Earth than do the asteroids in the asteroid belt.

Although there is no written record of an asteroid hitting Earth, the number of asteroids around us, as well as our observational experience of celestial bodies, make asteroids a very real threat. Compared to threats from the universe and the threat of the sun evolving into a red giant, the threat of asteroids seems much more immediate. The numerous records of meteorites impacting Earth are a warning themselves, seeing as meteorites are just smaller versions of asteroids.

On February 15, 2013, a meteorite penetrated the atmosphere above Russia's Chelyabinsk and exploded into pieces, forming meteorite rain. The shock waves produced by friction between the meteorite and the atmosphere caused many buildings' windows to explode, injuring more than a thousand people. This event was filmed by a number of people.

If a large enough asteroid were to hit Earth, it could destroy humanity; even a relatively large asteroid colliding with Earth could greatly damage humanity. Due to this, several major countries have devoted considerable effort into observing and studying asteroids. For example,

the US congress requires NASA to record and classify any asteroids that are more than one kilometer in diameter.

At present, we have discovered close to thirty thousand near-Earth asteroids, 1,100 of those are larger than one kilometer in diameter, and the largest of them all is the famous 433 Eros asteroid. Eros' orbit lies between Earth and Mars; its diameter is twenty-two kilometers. If an asteroid this size hit Earth, it would greatly affect global ecology; many species would go extinct, humans would suffer great destruction, and human cultural achievements would be damaged significantly. Fortunately, we have a very thorough under- standing of this asteroid. The NEAR-Shoemaker unmanned probe launched by NASA on February 14, 2000, successfully entered the orbit of Eros and landed on it after a year of close-up survey on February 12, 2001, conducting very fruitful research of the asteroid.

However, we do not know all the near-Earth asteroids as well as we do Eros, and we have especially inadequate understanding of the smaller asteroids. For example, on March 18, 2004, the small celestial body 2004 FH flew over Earth's surface at a distance of 43,000 kilometers, but scientists did not discover it until three days before the flight. If the thirty-meter-diameter celestial body had hit a medium-sized city, that city would have been demolished. Of course, such demolition is far from enough to destroy humanity.

Some of the closer near-Earth asteroids could bring great disaster if they collided with Earth. According to observation and analysis, the asteroid (29075) 1950DA will fly very low over Earth's surface in 2880. If its orbit changes even a little, it may hit Earth. If this asteroid, which is 1.4 kilometer in diameter, collided with Earth, the disaster it would bring could affect Earth's ecology on a global scale. Huge numbers of creatures (including humans) in a tens of thousands square kilometers range would be largely destroyed. Fortunately, there are more than eight hundred years left for us to re-evaluate the orbit of this asteroid and deal with its possible impact.

2. Comet Collision

Comets are composed of rock, frozen water, carbon dioxide, dust, and various impurities; they are celestial bodies of relatively small mass. If all the material in a larger comet were compressed together, its diameter would not exceed tens of kilometers.

The core of the comet is called the nucleus, and the outer cloudy layer encircling the core is called the coma. When the comet approaches the sun, strong solar winds and radiation pressure from the sun pushes the coma into a long tail. Comet tails range from tens of thousands of kilometers to hundreds of millions of kilometers in length. The comet tail usually has very sparse material; its density is only one quadrillionth of the earth's surface atmosphere.

The path of a comet is very hard to predict, as their orbits can be elliptical, parabolic, or even hyperbolic. Moreover, the orbit of a comet is susceptible to influence from the planets it passes, and even the stars in the distance. As a result, some comets' paths change constantly, other comets disappear into space, and new comets arrive inexplicably to the solar system.

Many comets exist in the solar system, but only 1,600 have been observed by scientists, and very few of their orbits have been grasped. The orbit cycle of comets also differs greatly. Short ones last a few years or more than one hundred days, while longer ones may reach thousands of years or even tens of thousands of years.

Comets themselves are very unstable. Every time they pass the sun, some of their material is blown away into space by solar winds, so a comet's mass is always shrinking until only the nucleus is left. Some comets composed exclusively of ice and dust may eventually disappear completely.

Comets may also be disintegrated by the gravitational force of the sun or other planets. The famous Bella comet is one such example; its revolution cycle around the sun was 6.6 years. On January 13, 1846, the Bella comet suddenly split into two. When the two halves returned, they returned simultaneously as a pair of comets and disappeared after 1859. Large meteor showers occurred later where their orbit intersected with Earth's orbit, indicating that the Bella comet had completely disintegrated.

When bigger comets collide with Earth, the threat the humanity is obvious. So far, the largest recorded comet collision happened on June 30,1908, when a violent explosion occurred atop Tunguska in Siberia, Russia. The huge fireball explosion could be seen and heard from more than one thousand kilometers away, and the shock waves from the explosion tore down and burned hundreds of square kilometers of forest. All the animals in the forest died, including a large group of reindeer that were grazing in the area. Fortunately, the area was uninhabited, so there were no human casualties. In later investigations, scientists found only burnt land and animal corpses with no trace of meteorites or craters. It is thus inferred that this was a comet com- posed completely of water. When the comet entered Earth's atmosphere, the high temperatures produced by friction caused violent evaporation, which led to the huge explosion ten kilometers above ground.

Compared to large asteroids, the impact of comets has slightly less catastrophic influence on humanity; however, a large enough comet impacting Earth could still cause devastating losses to humanity—it would just not be enough to cause the total destruction of humanity.

Near-Earth comets are much smaller than near-Earth asteroids, and they generally have long tails that are easy to observe. At present, we have already observed about fifty near-Earth comets. This number is significantly less than that of near-Earth asteroids, seemingly indicating that the possibility of comets colliding with Earth is much smaller—that is not the case. The most prominent feature of comets is that they are extremely susceptible to disturbances from the sun and large planets. Comets at the very edge of the solar system may inexplicably travel to the inner side of the solar system sometimes. In short, the possibility of comets crashing into Earth is higher than that of asteroids colliding with Earth, and they are much harder to take precautions against; therefore, in recent years, scientist have paid more and more attention on comet research.

3. Comprehensive Analysis of Extraterrestrial Body Collision

The possibility of large extraterrestrial bodies colliding with Earth is very small, but a large enough asteroid hitting Earth could destroy humanity once and for all. That is why we cannot ignore the issue just because of its low probability. One chance encounter and humanity may never recover; more- over, such collisions can occur.

Exactly what kind of threat do extraterrestrial bodies pose to humanity? Many scientists have conducted in-depth research on this topic, but the views differ greatly. Different people have reached different conclusions. After considering a variety of different views, the following conclusions can be drawn:

a. The larger the celestial body, the less likely it will collide. As the large celestial objects of the solar system (including Earth) each orbit on their own trajectories over and over, the impact frequency will only decrease.

b. The following can be estimated concerning the impact frequency and perils of different sized celestial bodies:

i. A celestial body eighty meters in diameter may collide every one hundred years. Such a collision could destroy a large amount of life within an area of a few hundred square kilometers, and it would influence the ecological environment tens of thousands of square kilometers around it.

ii. A celestial body eight hundred meters in diameter may collide every two thousand years. Such a collision may result in the destruction of most life within tens of thousands of square kilometers and influence the ecological environment for millions of square kilometers.

iii. A celestial body three kilometers in diameter may collide every ten million years. This impact could destroy most life within one or two hundred thousand square kilometers, and the ecology of the entire world would be affected.

iv. A celestial body over ten kilometers in diameter may collide with Earth every seventy million years. This collision could cause the destruction of many species around the world and seriously damage global ecology; it would take many years for the earth to recover.

v. A celestial body over one hundred kilometers in diameter may collide once every hundred million years; it could destroy global ecology, humanity, and human civilization in one swoop.

c. The most terrifying and relatively realistic celestial collision would be a collision with the asteroid Eros. Eros is the largest near-Earth asteroid, and as a twenty-two-kilometer asteroid, it would cause massive casualties, devastate Earth’s ecology, and ravage human civilization upon impact. However, collision from Eros would not lead to human extinction. On top of that, Eros

shows no sign of hitting Earth at the moment, and we employ very reliable tracking and observation of this asteroid as a cautionary measure.

In reality, we have now developed a considerable ability to guard against extraterrestrial body collisions. The development of space observation tech- nology has enabled us to develop a more detailed understanding of how celestial bodies operate and are distributed in the solar system. We are getting better at monitoring the larger celestial bodies that constitute a threat to the survival of mankind. As space technology continues to progress, we are increasingly capable of traveling in space. Humans have already landed on the moon, and consecutive Mars or other planet landings are fully achievable in this century. As for the explosion of nuclear warheads, they are not only capable of destroying large celestial bodies, but they can also change the trajectories of such bodies. Moreover, we not only have spacecrafts that can accurately send these nuclear warheads into the depth of space, but also intercontinental missiles that can send warheads into the space near Earth. With these conditions, it is becoming increasingly possible that humans will be able to intercept any celestial bodies that may collide with Earth.

Scientists have optimistically estimated that as long as we can predict possible celestial body collisions a few years ahead of time, we can change their trajectory and send them away from Earth. If we could predict such celestial body collisions a few decades in advance, we could use spacecrafts to send ordinary explosives into space, slightly changing the orbit of the celestial body and protecting Earth from impact. Therefore, as long as humans further improve their observation abilities, avoiding the impact of small celestial bodies is a very real possibility.

In fact, scientists possess a variety of suggestions for coping with celestial body impact. Some propose the use of lasers to slow down the asteroid and change its trajectory; some have suggested that a smaller asteroid can be propelled to collide with the asteroid coming towards Earth, changing its direction. Scientists have also proposed a number of options to prevent asteroid impact, like launching missiles or spacecrafts to crash into asteroids and change their trajectory; launching gravitational spacecrafts to approach and change the direction of asteroids through gravity; launching spacecrafts to land on asteroids and gradually change their orbit with electric motors; or fitting asteroids with solar sails to change their track.

According to reports, the United States is studying the use of the Yarkovsky effect to change the orbit of asteroids. This is accomplished by unmanned probes hovering over asteroids to spray their surface and change their sunlight reflectivity, thereby changing their absorption of sunlight and heat, which in turn changes their orbit.

SECTION THREE : THREATS FROM EARTH

From space, our Earth stands out as a beautiful blue planet that is completely unique. It is the only ecological planet and the only civilized planet within humans' current field of space vision. Its beauty is unparalleled.

The earth is mainly composed of metals and rocks, and its surface is mainly ocean. Earth is more than 70 percent composed of ocean, while land occupies less than 30 percent of the earth's surface. Earth is not perfectly spherical in shape; its equatorial radius is about 6,378 kilometers, twenty-one kilometers larger than its radius. Earth's highest peak is Mount Everest, measuring 8844.43 meters in altitude, and its deepest ocean is the eleven-kilometer deep Mariana Trench. Overall, the total surface undulation of Earth is twenty kilometers.

The earth's interior is made up of the core, mantle, and crust, while the exterior is composed of the hydrosphere, atmosphere, and magnetic field. The different parts of Earth's interior and exterior form the whole of Earth.

Earth is the mother of humans; it gave birth to and continues to nurture humanity. But the Earth is not a gentle mother—earthquakes, volcanoes, floods, and storms have claimed the lives of and brought suffering to count-less people and made many others homeless. We have profound understanding of Earth's importance to humanity, and we are uniquely attached to it. Without Earth, humans would not be able to survive, which is why we must consider how Earth may influence human survival.

One: Plate Motions, Earthquakes, and Volcanoes

As early as the nineteenth century, while laying cables on the ocean floor, people discovered that the central seabed of the Atlantic was shallower than its edges. After further study of the Atlantic, a central ridge was discovered rising from the depths of the ocean. Islands like the Azores and Ascension are all the exposed parts of that ridge. While conducting echo detection in the Pacific Ocean afterwards, scientists found a long, flat-top seamount along the eastern Pacific seabed as well.

In the 1950s, research of the ocean became more thorough, and scientists confirmed that a continuous sixty to seventy thousand-kilometer-long submarine mountain range existed in the world's major oceans. Since this mountain range was located in the center areas of the Atlantic and Indian oceans, it was named the mid-ocean ridge. The aforementioned Atlantic central ridge and Pacific flat-top seamount are both parts of the mid-ocean ridge. The total length of the mid-ocean ridge is enough to circle Earth twice; none of Earth's land mountains can compare with this unseen mountain buried deep under the sea.

Further study of the mid-ocean ridge showed that a deep rift existed on top of the ridge, one thousand to two thousand meters in depth. It splits the mid-ocean ridge in two, a phenomenon that is particularly evident in the mid-Atlantic ridge. Frequent earthquake and volcano activity can be found near the mid-ocean ridge. Through seismic wave analysis, it is possible to determine that the seismic wave velocity at the mantle of the mid-ocean ridge is smaller than it is at other mantles, showing that the mantle material underneath the mid-ocean ridge is hotter and lighter. The continuous expansion of this material caused the mid-ocean ridge to rise up.

Further understanding of the ocean also includes oceanic trench detection; the deepest sea trench is two thousand meters higher than the world's highest peak. Among the world's oceans, the Pacific coast has the most wide-spread distribution of trenches, as well as the most significant drops.

After summing up large amounts of geological surveys and research data, scientists proposed the theory of seafloor spreading. They believe the upwelling of Earth's mantle to be the driving force of the ocean's expansion. The top of the mid-ocean ridge is like an outlet for the rising magma, which tears apart the oceanic crust and pushes it to the side. Once the magma cools it fills the tear, causing the mid-ocean ridge to expand on both sides. The uplifting of the mid-ocean ridge is the result of thermal expansion from rising magma.

To be specific, it is rising magma from the mantle that expands the mid-Atlantic ridge and splits the Atlantic Ocean into the West Atlantic and America side, and the East Atlantic, Africa, and Europe side. Continuously rising magma constantly pushes the oceanic crust of both sides, moving the western Atlantic Ocean and America further westward, and the eastern Atlantic Ocean, Africa, and Europe further eastward. That is why the Atlantic is becoming wider and wider.

Where does the space from the mid-ocean ridge's expansion come from? In other words, as the Atlantic is widening, which area is shrinking accordingly? The answer lies in the Pacific Ocean on the other side of the globe. While rising magma at the mid-Atlantic ridge expands the Atlantic, the same is happening at the mid-Pacific ridge, only bringing different results. Since there is no more room to accommodate the Pacific Ocean's crust, the oceanic crust must choose a downward subduction at the junction of land and sea, right were the trenches are located. Here, the oceanic crust goes underground and is melted into magma by the high temperature of the mantle. Therefore, as the magma at the mid-Pacific ridge propels the oceanic crust to expand, the Pacific not only does not widen but also must undertake the expansion from the Atlantic Ocean, narrowing it continuously as a result. For these reasons, we will find few trenches along the Atlantic, while the Pacific Ocean is surrounded by trenches.

Seafloor spreading is a continuation and development of the continental drift theory, and plate tectonics was built on its basis. Scientists believe there to be several clear fissures on the earth's lithosphere; they divide the earth's crust into several units signaled by mid-ocean ridges, trenches, and faults, forming relatively independent plates. These plates float on the mantle's asthenosphere and are propelled into constant movement by Earth's internal heat. By moving away from or against each other, plates form mountains, canyons, rivers, ridges, trenches, and island arcs.

Earthquakes and volcanoes are closely related to the tectonics and movements of plates. Historical earthquake and volcano distribution data shows that plate boundaries are consistent with the dispersal of earthquakes and volcanoes. For example, China's Taiwan and Japan's Ryukyu Islands are prone to earthquakes due to collisions between the Philippine plate and the Eurasian plate, and the Luzon volcano arc is located east of the north Luzon trough formed by these collisions. Earthquakes also occur frequently in the San Francisco area of the United States, which is due to the movements of the Pacific and American plates.

The disaster brought on by earthquakes and volcanoes is both persistent and large-scale. To use volcanic eruption as an example, on August 24, year 79, the Vesuvius volcano in Italy erupted suddenly, burying the bustling city of Pompeii in an instant. More than a thousand years later, people discovered this buried city by chance. The dying moments of the city's residents had been clearly preserved, and it was clear how frightened and unprepared they were. In 1902, the Pelée volcano on the Caribbean Martinique island erupted. During the initial eruption on April 25, volcanic ash and steam shot into the sky, and the rumbling echoed into the distance. Residents of Saint-Pierre, ten kilometers away, watched this rare spectacle excitedly for days. However, on May 18, the volcano became suddenly violent and the eruption height rose to several hundred meters. Volcanic ash containing toxic gas bore down over Saint-Pierre. The beautiful harbor city lit up in flames, killing all 28,000 people; only one prisoner and one shoe repairman survived. Afterwards, it was learned that the prisoner survived because he was kept in an enclosed semi-basement; none of the police guarding him were spared.

The earthquakes produced by plate activity are even more destructive, such as the famous Japanese Kanto earthquake that resulted in 143,000 deaths. The earthquake that claimed the most lives in the past century was the Chinese Tangshan earthquake that occurred in the Tangshan city of Hebei province. At 3:43 in the morning on July 28, 1976, a 7.8 magnitude earthquake shook the slumbering city and destroyed the industrial city of Tangshan in mere seconds; 242,000 people were killed and 164,000 were seriously injured.

The Wenchuan earthquake that took place in Sichuan, China, was another deadly disaster. On May 12, 2008, at 2:00 p.m., the collision of the Indian plate and the Asian plate resulted in an 8.0 magnitude earthquake in the mountains of Sichuan. The destruction and scope of this earthquake surpassed even the Tangshan earthquake. The capital, Beijing, thousands of kilometers away, as well as neighboring Thailand, Myanmar, and other countries, all felt a significant shock. Ninety thousand people died or went missing, and more than three hundred thousand were injured. Thirty barrier lakes were formed in the alpine canyons. If this earthquake had occurred at night or in a densely populated area, the casualties would have been even more unimaginable.

Earthquakes and volcanoes also lead to tsunamis and fires. The 1923 Tokyo earthquake struck during lunchtime; the shocks from the earthquake overturned stoves and ignited over two hundred fires. More than one hundred thousand people were burnt to death.

The largest tsunami on record happened on December 26, 2004, when an 8.9 magnitude earthquake shook the seabed of the Indian Ocean near Sumatra, Indonesia. The ensuing tsunami ravaged Indonesia, Sri Lanka, India, Thailand, and more than a dozen other countries. Even the distant east coast of Africa was affected. Most of the areas affected by the tsunami were famous tourist destinations, and as it was tourist season, tourists from all over the world had gathered on the waterfront, unprepared for the devastating catastrophe. The number of deaths and disappearances caused by the tsunami eventually exceeded 225,000.

The 9.5 magnitude Chilean earthquake in 1960 was the largest earthquake ever recorded. It brought on a tsunami that produced waves over twenty-five meters high; 10.7-meter-high waves

were recorded ten thousand kilometers away from the earthquake's epicenter. The main tsunami spread across the Pacific to affect Japan, the Philippines, and other areas across the ocean.

No matter how much devastation earthquakes and volcanoes may bring, they only affect individuals and groups. The overall survival and happiness of humanity is not threatened.

We should actually adopt a more objective and scientific view of plate activity. There would be no mountains and rivers without plate activity, and thus no ecological cycle. Earth would lack vitality, and life would have difficulty developing and evolving in such an environment.

After studying the planets and satellites of the solar system, astronomers argued that Earth is the only planet that has plate movement within this star system. To take our satellite moon as an example, we can see that its surface is covered in craters formed three to four billion years ago. The earth exists in a similar environment to the moon, but the initial traces on Earth's surface have mostly been updated and are no longer visible. It is Earth's unique plate tectonics that grants this 4.6 billion-year-old planet energy, so it is an important factor in Earth's development as a planet full of life and civilization.

In reality, plate activity benefits mankind even while it brings disaster. The formation of many important deposits is closely related to plate activity, and plate activity leads to the exchange of material and energy between the litho-sphere, asthenosphere, hydrosphere, and atmosphere, producing the variety of minerals that humans use every day.

Two: Climate Change and Glaciation

The normal climate change of Earth follows a pattern: winter is cold, spring and autumn are warm, and summer is hot. This is because different parts of Earth receive sunlight differently. Even along the equator, where temperature differences are smaller, there are rainy seasons and dry seasons. There are often years when the climate is abnormal, hot spells may last longer, or the cold season may be lengthened. These instances usually bring trouble; for example, global warming can cause floods, hurricanes, epidemics, or increased agricultural pests; and drops in temperature can affect agricultural production, freeze livestock to death, cause traffic jams, and injure people through avalanches and other disasters. However, these do not significantly affect the survival of humanity. Agricultural production will fluctuate from year to year, and problems like disease, floods, and avalanches do no endanger humanity as a whole. Alternating seasons are especially beneficial to humans; they enrich our lives, and winters provide relaxing respite after the long planting and harvesting seasons. This has been the way of our ancestors for centuries. At the same time, everything should abide by a limit. Once this limit is surpassed, good things may become disasters, and tens of thousands of years of heat or cold would be a completely different situation.

The surface of Earth not only has seasonal changes, but also goes through long spells of extreme heat or cold from time to time. Sometimes these long spells last tens of millions or even hundreds of millions of years. Seven million years ago, the earth experienced a period of extreme cold, and snow and ice covered most of the globe for tens of millions of years. Even the equator showed

traces of glaciers. One hundred million year ago, the earth also experienced a period of extreme heat. For tens of millions of years, ice melted in the two poles; Antarctica and Greenland were as warm as spring, and even dinosaurs roamed there.

The earth constantly fluctuates between hot and cold, and scientists have discovered a pattern to this fluctuation. A long cold period usually occurs every 250 million years; this is called an ice age. The temperature is not static during this time; in fact, every ice age can be divided into several smaller glacial periods (or glaciations), and the warmer interval between consecutive glacial periods is called an interglacial period. Currently, we are in an interglacial stage of the Quaternary glaciation (also known as the Pleistocene glaciation, or the current ice age). In the two million years of the Quaternary glaciation, there have been several glacial and interglacial periods, but we do not feel the cold of the ice age since we are in an interglacial period.

The last glacial period started eighteen thousand years ago and ended ten thousand years ago. During that time, Greenland, Canada, Alaska, Siberia, Iceland, and most of northern Europe were covered in ice and snow. Large amounts of seawater were converted to snow and ice, resulting in a 150-meter drop in sea level. The Bering Strait disappeared and joined North America with Siberia; in Asia, the seabed of China's Yellow Sea and Bohai were exposed; the Korean Strait and the Tsushima Strait disappeared; Japan became connected with Eurasia; and Indonesia joined with Asia. In Western Europe, seawater withdrew from the English Channel, and the British Isles became part of the European continent. Australia connected with the Asian continent through a land bridge.

Scientists have done much research on the earth's alternating glacial periods, and there are many differing views concerning its cause. For example, some people think that the uplifting of the Himalayas from the sea caused carbon dioxide in the air to combine with rock rising from the ocean, lowering the carbon dioxide content in the atmosphere and causing a drop in global temperature. Others believe there to be a dense interstellar cloud along the sun's orbit around the Galactic Center that partially covers the sun and changes Earth's surface temperature (though it is not visible from Earth to the naked eye). This theory is supported by the fact that ice ages share the same 250 million years cycle as the sun's rotation around the Galactic Center. None of the current views can fully explain the fundamental cause of ice ages convincingly. It is most likely that ice ages are the result of a combination of factors, including some that we may not yet recognize.

The larger climate change cycles of Earth affect global ecology and human life, but they do not affect the overall survival of humanity. Global climate change happens gradually, not suddenly. In a glacial period, ice first covers the two poles and then extends from higher latitudes to lower latitudes. The higher latitudes of both the north and south hemisphere are not suitable for human habitation or farming; however, as ice and snow coverage expands, the sea will retreat and land will be exposed to create areas suitable for human habitation and agricultural production. Oxygen dissolves easier in colder seawater, making it more conducive to the growth of marine life, which is why the polar regions are swimming with fish and shrimp. Whales, seals, walruses, and penguins all survive in the polar regions due to a rich marine life food source.

As the global temperature continues to climb and melt the polar ice sheets, and sea levels rise and erode coastal lowlands, there seems to be less space for human habitation and farming. That is not the case. As temperatures increase and snow melts, the Antarctic continent and Greenland will become suitable for living and planting, and the originally harsh environments in northern Siberia, northern Canada, and northern Scandinavia will become pleasant pastures and farmlands. The increase in land also includes the land that had previously been pushed thousands of meters under water by ice sheets. Once the snow melts, they will rise continuously until they reach the surface. The rise in temperature will also be beneficial to plant life and animal reproduction. Climate change is able to maintain a balance on Earth; the ecological environment and humans' habitation space will not change too drastically as global temperatures rise and fall.

Even if we take the situation to the extreme and reimagine the ice age of seven hundred million years ago when glaciers spread to the equator, the overall survival of humanity would not be in danger. The development of science and technology today is enough to produce fresh fruit and vegetables in greenhouses during the dead of winter, providing us with enough confidence to overcome glaciations.

In the two million years since the Quaternary glaciation, humans have evolved from ordinary people to Homo sapiens. Animals evolved thicker skin and longer hair to combat cold weather, but humans developed less and less body hair because we learned how to use animal skins as clothing and how to gain warmth from fire. Our brave ancestors did not flee to the warmth of the equator in the face of cold weather; instead, they moved boldly to Asia and Europe and survived in the more severe conditions there.

The cold of the glacial period caused ice to cover the higher latitude areas, and sea level to drop more than one hundred meters, causing the Bering Strait to vanish and forming the land bridge between Asia and Australia. Humans entered Australia via the land bridge and migrated to the Americas through the Bering Strait, spreading human footprints over the entire world.

Many creatures were unable to withstand the cold of the Quaternary glaciation and went extinct one by one, but humans continued to evolve and strengthen in the struggle against nature. Those primitive conditions did not destroy the ancestors of man; thus, we have no reason to fear that modern humans, who have higher degrees of wisdom and advanced science and technology, will succumb to the cold.

Simple life-forms existed on Earth 4.28 billion years ago, complex life evolved in the ocean 530 million years ago, and a variety of creatures came onto land 400 million years ago. During this period, the earth went through numerous glaciations and many species died out, yet life has continued to this day without interruption. Earth today has more wisdom and civilization than ever before, which shows us that glaciations are nothing to fear.

Three: Magnetic Field Disappearance

Space is full of cosmic rays that originate from high-energy particles and attack our planet incessantly at a speed close to that of light. If humans or other creatures were directly attacked by cosmic rays, the high-energy particles could penetrate cells—not only killing the cells but also changing or destroying genetic material.

We generally do not suffer the harm of cosmic rays because Earth's surface has three layers of safeguards against them. The first safeguard is Earth's surface atmosphere, which also happens to be the most powerful barrier. When cosmic rays travel to Earth at high speeds, they collide with the molecules and atoms in the atmosphere. After every collision, the cosmic ray's energy decreases. Once the energy particles reach Earth, their energy level is so low they cause minimal damage to humans.

The earth's magnetic field is another safeguard. When cosmic rays pass through the magnetic field they must use their energy to overcome the magnetism within the field. Some lower energy cosmic rays will be captured by Earth's magnetic field without ever reaching Earth's surface, while higher energy cosmic rays will also suffer great damage by the time they pass through. Earth's magnetic field is the secondary barrier outside the atmospheric barrier.

The final layer of protection against cosmic rays is the interplanetary magnetic field from the sun. This field wraps around Earth's magnetic field and serves a similar function in consuming the energy of cosmic rays. This magnetic field is vitally important in protecting life on Earth, yet long-term observance shows that the field is not always stable. It fluctuates in strength, swaps between north and south magnetic poles, and sometimes vanishes altogether, leaving Earth vulnerable. To consider the effects of geomagnetism disappearing, we must first understand the basic nature of geomagnetic fields.

In physics, we all know that electricity and magnetism can interact in a phenomenon called electromagnetism; that is, electricity can sense magnetism, and vice versa. Earth's core is partially composed of molten iron and nickel; this liquid metal moves in a rotating motion within Earth's core due to Earth's rapid rotation. This is as if a giant electrical current were flowing underground, producing a strong magnetic field, which is Earth's magnetic field.

The study of paleogeography found geomagnetic fields to be changing following this pattern: geomagnetic poles are located close to Earth's poles. The intensity of the magnetic field will gradually weaken after passing the strongest point, disappearing briefly before gaining back its former strength. The magnetic poles will be reversed during this cycle. In the past seven hundred thousand years, Earth's magnetic field has followed its current direction, but it was reversed in the 450,000 years before that. After studying the geomagnetic field's movements over the past one hundred million years, it was discovered that the magnetic poles reverse every four hundred thousand to five hundred thousand years. The shortest reversal period was fifty thou-sand years.

A reasonable explanation for magnetic pole reversal has been proposed: it is caused by the flow direction change of molten iron and nickel in Earth's core. The iron and nickel in Earth's core does not always flow in one direction once the flow direction reverses Earth's magnetic poles

reverse accordingly. During the moment of critical pause when flow direction is changing, geo-magnetism will vanish briefly. Since the flow of molten iron and nickel at Earth's core follows Earth's rotation, the magnetic pile will not deviate far from the two poles, no matter its orientation.

What happens to Earth during the brief period of geomagnetism disappearance? One thing is for certain; under normal circumstances, cosmic rays and solar particles cannot cause lethal damage to humanity due to the protection from Earth's atmosphere. In the four million years of human evolution, the Earth's magnetic field has disappeared briefly numerous times without affecting mankind or other Earth creatures very much. Through research of atmospheric protection against cosmic rays and solar radiation, scientists have proven that geomagnetism disappearance will not have a decisive impact on the survival of humanity in normal circumstances. What about the unusual circumstances? In the next few billion years of human survival, unusual circumstances are likely to occur.

The most important sources of cosmic rays are supernova events in the Milky Way. Every supernova of considerable scale releases cosmic rays tens of thousands of trillions of times that of the sun. What would happen if a supernova event took place not far from us? Studies have shown that with the protection of the atmosphere, Earth's magnetic field, and the sun's magnetic field, high-intensity cosmic rays cannot compromise human survival as long as the supernova event is more than twenty-five light-years away. However, if Earth's magnetic field disappeared at this critical moment, the situation would be much more severe. With the disappearance of geomagnetism, the earth would suffer attack from both solar particles and cosmic rays; the earth's atmosphere and the sun's magnetic field would not be enough to withstand such a double attack. Therefore, the safe distance would have to be pushed back to thirty light-years. Moreover, geomagnetism changes today indicate that a brief disappearance of Earth's magnetic field will occur in the next ten thousand years.

In the next ten thousand years, the most likely supernova event close to Earth is Betelgeuse. Fortunately, Betelgeuse is 640 light-years away, meaning that Earth's atmosphere and the sun's magnetic field would offer sufficient protection, even if the outbreak coincided with geomagnetic field disappear-ance. In fact, there is no possible supernova within thirty light-years of us, and scientists have determined the probability of a supernova within that distance to be once every ten billion years. With such a small window of opportunity, it is extremely unlikely that such an event will occur simultaneously with geomagnetism disappearance.

Even if such an unlikely coincidence were to occur, we would not need to worry. Firstly, with Earth's atmosphere and the sun's magnetic field serving as two shields, cosmic rays produced by a supernova within close distance would be sufficiently weakened so as not to endanger the overall survival of mankind. Secondly, the strong cosmic rays generated by the supernova would not last long (a few weeks at most), and there would be warning signs in advance so that proper arrangements could be made to avoid injury. The walls and roofs of our houses can all offer protection from cosmic rays. As long as we properly fortify our dwellings and limit outside exposure, we can avoid being harmed by cosmic rays.

SECTION FOUR: THREATS FROM EXTRATERRESTRIAL LIFE

Extraterrestrial life refers to intelligent life from outside our planet; we usually call them aliens. People are quite keen on the subject of alien invasion. Many science fiction movies use this as a selling point and promote productions with this theme. However, actual alien invasion would be devastating to mankind, as humans would be a completely different species in the eyes of aliens. Aliens might treat humans without any sympathy or humanity, just as we have treated other animals in the past. They could carry out a massacre against us that would surpass Hitler's massacre of the Jews. Of course, it is also possible that extraterrestrial life would be friendly and visit Earth in the spirit of tourism, friendship, or curiosity instead of invasion. In any case, it is much more important to safeguard against alien invasion and attack than to hope for friendliness.

So far we have not found any evidence of the existence of extraterrestrial life. Archaeological excavations and geological surveys of Earth have not turned up evidence of aliens visiting our planet in the past either. The idea of aliens is still a product of people's subjective imaginations.

Even so, from the long-term perspective of human survival, we have sufficient reason to consider the threat of extraterrestrial life seriously.

Humans are the only intelligent life we currently know of. Apart from traces of life factors found in very few fallen asteroids, no other clues of extraterrestrial life have been discovered. We can only infer the possibility of alien existence through the study of Earth's humans and deduce their possible location and threat to us accordingly.

One: Life on Earth

After close distance observation and in-depth scientific analysis of the solar system planets and their satellites, it can be confirmed that within the solar system, only Earth has the conditions to produce complex life. What gave Earth the power to produce life?

Celestial collisions were an inevitable process of Earth's formation. Many asteroids, meteorites, and comets contain water molecules. When they collide with each other to form larger celestial bodies, these water molecules are transferred accordingly. Volcanoes and magma flow are formed through collisions, and their high temperature evaporates water molecules into carbon dioxide gas. Earth's early atmosphere was mainly composed of carbon dioxide gas.

Carbon dioxide cannot nurture complex life; it produces a greenhouse effect instead. Shortly after the formation of the ocean, microbes formed in the water. The earliest microbes were born 4.28 billion years ago, only a few hundred million years after Earth formed. Large numbers of algae creatures appeared shortly after and absorbed carbon dioxide and released oxygen.

This process of carbon dioxide to oxygen conversion took more than three billion years because Earth had a high demand for oxygen. Oxidation reactions would occur when oxygen encountered most metals—iron oxide, copper oxide, and alumina are all conjugates of oxygen and elements. The oxygen released by algae had to meet the demands of these oxygen consumers first.

The geological era 530 million years ago was known as the Cambrian Era. During this time, a number of complex organisms seemed to appear simultaneously in the vast ocean; this phenomenon was known as the Cambrian explosion. We know that animals need oxygen to survive, so the Cambrian Era must have been an era when oxygen production exceeded oxygen consumption. The surplus of oxygen was a prerequisite for the Cambrian explosion. Organisms only existed in the ocean at this time, so the land was barren of life. One hundred million years passed—about four hundred million years ago—before life came to land. Plants and animals arrived on land at the same time.

While animals must absorb oxygen to survive, plants absorb carbon dioxide and produce oxygen; therefore, plants should have existed on land shortly after marine life came into existence. Why then did plants and animals arrive on land simultaneously after such a long interval? Scientific research shows that the ozone layer above Earth's atmosphere formed four hundred million years ago, identical to the timeline of biological life arriving on land. Is this a coincidence?

The glory of the sun is often described as the number one element for life. Without the sun's light and warmth, life could not be. The sun's energy is nuclear energy, so its glory includes not only the warmth we need but also extremely strong lethal rays, like ultraviolet rays, X-rays, and gamma rays. If astronauts did not have protective devices, they would be killed by sunrays in space.

The atmosphere is a protective layer that absorbs harmful rays, but it is far from enough. About four hundred million years ago, the ozone layer formed due to a surplus of oxygen, and it proved to be particularly capable of absorbing harmful rays. Although the ozone layer is relatively small compared to the atmosphere, it was enough to protect life from harmful rays and allow them to emerge from the ocean's protection and onto the land.

The moon is another great "shield." As a satellite of Earth, it has blocked the attack of many foreign objects. At the same time, a series of other bigger planets like Jupiter, Saturn, Uranus, and Neptune revolve around the sun outside of Earth. They possess greater mass and stronger gravity than Earth. It is their gravity that pulls asteroids away from the inner circle of the solar system, shielding Earth from impact with extraterrestrial objects. Some scientists have asserted that Earth would never have conceived intelligent life without its protectors in the solar system. The birth of intelligent life takes a very long time, so if a large celestial collision occurred whenever the birthing process was close to completion, all past efforts would come to naught.

In recent years, humans have focused space exploration efforts on our neighbors, Mars and Venus. Our detectors have landed on these two planets and much close proximity observation has been carried out as well. Observations show that although Mars' distance from the sun is only one third greater than that of Earth, its surface temperature is lower than -60ºC. The diameter of Mars is

only half of Earth's diameter, and its mass is one- tenth of Earth's, making it difficult to capture external air. Mars only has an extremely thin layer of air on its surface; its density is less than 1 percent of Earth's atmosphere density and is mainly composed of carbon dioxide. Therefore, the environment on Mars is not conducive to the survival of life.

Venus has the most similar conditions to Earth. Its diameter is only slightly smaller than Earth, its weight is 80 percent that of Earth's, and it is only a quarter distance closer to the sun. Unfortunately, if Earth were paradise, Venus would be hell. Its surface temperature can reach 500ºC, there is no water, a thick layer of carbon dioxide atmosphere with pressure nine times higher than the Earth's atmosphere blankets its surface, and traces of volcanic magma erosion linger all around. No life could possibly survive in such an environment; however, we have discovered traces of shallow oceans on the surface of Venus. These shallow waters disappeared about three billion years ago.

Why does Venus lack the ability to produce life when its planetary conditions are so similar to Earth's? Moreover, why do these two similar planets have such differences in their natural environments? Many explanations have been suggested, and among them, two are highly recognized. The first view holds that the answer lies in Venus' slightly closer proximity to the sun. When the sun's temperature rose three billion years ago, it evaporated the water on Venus. This means that the one-quarter disparity between Venus and Earth's distance to the sun completely changed the fate of the two planets.

The other view holds that the different fate of the two planets is not due to their distances to the sun but to Venus' slow rotation. The metal magma at Earth's center produced a magnetic field due to Earth's rapid rotation, whereas the slow rotation of Venus could not produce such a force field. This foreshadowed the fate of the two planets. Scientists believe that the magnetic field plays a decisive role in planet evolution and the birth of life, because it prevents solar winds and cosmic rays from harming life. Venus experienced asteroid collision just like Earth in its early stages. It formed oceans and a carbon dioxide atmosphere as well; however, due to the absence of its own magnetic field, solar winds and cosmic rays eliminated algae and even bacteria from Venus. With no system to absorb carbon dioxide and produce oxygen, the carbon dioxide atmosphere thickened increasingly, strengthening the greenhouse effect and raising surface temperatures until all water was evaporated and the surface temperature reached its current 500ºC high.

Mars does not have a magnetic field either, even though it spins faster than Earth. Its small mass does not allow for magma at its core, so Mars is also void of magnetic field protection. The air on Mars' surface is also very thin and does not offer sufficient protection against solar particles and cosmic rays. If complex life-forms ever existed on Mars, they would have gone extinct some time ago.

When astronauts observed our planet from space, they found the earth to be a beautiful blue planet. It stands out like a small oasis in a vast desert. Over decades of research and exploration, scientists have marveled at the stringent conditions required to produce complex life. After summing up their results and carrying out a series of experiments, many returned to one simple starting point:

Earth is just one occasional occurrence in space. On one occasional planet in one occasional star system in the vast universe, a series of occasional incidents occurred over a relatively short period of time to produce an environment suitable for life, thus producing a monumental miracle: the birth of mankind.

However, we are not satisfied with this explanation. One scientific conclusion is for certain: as long as there is sufficient time and conditions, material activity will produce life—even intelligent life like humans. Nonetheless, too much time and too precise conditions are required, so we cannot accurately predict whether miracles of life exist in other corners of the universe.

Two: Prerequisites for the Birth of Intelligent Life

1. Star Systems That May Produce Intelligent Life

The conditions required for the birth of intelligent life are extremely precise. First, there must be a stable and continuously burning star. At the same time, the planet in question must satisfy many requirements and encounter many chance opportunities over a very long period of time. Our current abilities are far from adequate to apply this series of conditions to all the planets outside the solar system; however, we can set out some of the prerequisites needed. It must be noted that these are merely the indispensable conditions required to produce life, not the conclusive conditions that will guarantee life. Intelligent life cannot exist without these conditions, but these conditions do not promise the birth of intelligent life, since there are still many factors we do not yet understand. Let us first analyze the stellar conditions required to conceive intelligent life.

The star that forms a basis for intelligent life must satisfy the following:

a. It must be a star in the stage of hydrogen fusion; only stars in this stage burn stably.

b. Life cannot be born in large star systems. The greater the mass of the star, the more intense its internal thermonuclear reaction is, and the shorter it stays in its main star sequence. For example, a star 1.2 times the mass of the sun only stays in its main star sequence for about three billion years; according to the birth time of humanity (i.e., five billion years), even stars slightly larger than the sun cannot suffice.

c. Smaller stars cannot produce intelligent life around them either. The smaller a star, the less light and heat it produces, the closer a planet must be to obtain necessary warmth and glory. However, when planets are too close to stars, the gravitational pull of the star will slow its rotation, causing one side of the planet to bask in light and warmth while the other side is swallowed by darkness and cold. Complex life cannot appear on planets like this.

In addition, once a star is small enough to be a red dwarf, its surface will be very unstable and produce large flares and lethal rays. This type of star system is not suitable for the survival of complex life; 70 percent of the Milky Way is composed of red dwarves.

d. A completely suitable star must have experienced billions of years of stable burning, since intelligent life itself takes billions of years to form.

e. Intelligent life can only exist on a solid planet that has carbon, nitrogen, oxygen, iron, silicon, and other heavy elements. Since heavy elements are produced by large stars, only second- or third-generation stars can produce life around them.

f. Many binary and triple stars exist in the universe, but these star systems cannot produce life. In a star system like this, the stars will interfere with the planets around them due to their gravitational pull, resulting in very unstable planets.

g. It cannot be too close to large stars. Large stars end their lives as supernovas; before intelligent life-forms are sufficiently evolved, they do not have the ability to prevent the thermal radiation and cosmic ray injury brought on by supernovas. It cannot be too close to medium-sized binary stars either, since they form supernovas as well.

2. Planets That May Produce Intelligent Life

A suitable stellar environment satisfies only one condition in the birth of intelligent life. A suitable planet is also necessary, and it is much harder to come by. To use the solar system as an example, Earth is the only planet able to produce intelligent life. Even though Venus and Mars are very similar to Earth, they do not meet the necessary requirements. What conditions does a planet need to satisfy in order to produce intelligent life?

a. The planet must be large enough to “capture” atmosphere.

b. The planet’s atmosphere must be composed of carbon dioxide, oxygen, and also nitrogen. Hydrogen and helium exist in abundance within space, but planets with carbon dioxide and oxygen are rare.

c. The planet must be a metal-element based planet. In astronomy, all heavy elements apart from hydrogen and helium are considered metal elements; only metal planets are solid rock planets that can provide a foothold for life. Such planets are exceedingly rare in the universe.

d. The planet must be a suitable distance away from stars; this distance is called the habitable zone. If a planet is too far away it will not receive sufficient warmth; if it is too close it will be overheated.

e. The planet’s orbit around the star cannot have too large an eccentricity. If the eccentricity is too large and the orbit is flat oval in shape, the near point will be too close to the star and the far point will be too distant, resulting in extreme heat and cold.

f. The planet’s rotation axis cannot tilt too much. If the axis tilts too much, the planet will rotate on its side. Like Uranus, the planet will experience day for half a year and night for the other half. It

will also experience half a year of summer and half a year of winter. During summer, light will bake the planet until temperatures reach hundreds of degrees, but in winter, there will be no light and temperatures will reach -200°C. This environment would not be conducive to life.

g. The planet must satisfy a variety of other requirements to produce complex life; some may be absolutely necessary while others may not. For example, it is generally believed that water is indispensable to survival of life, but there are differing views regarding this point. Life on Earth metabolizes on an oxygen-water system, and it is speculated that life on other planets may metabolize on a nitrogen-liquid ammonia system, or some other material system. A suitable magnetic field may be necessary, as it prevents cosmic rays and stellar radiation from harming life. The existence of a series of larger surrounding planets, like Jupiter, may also be necessary to block frequent impact from asteroids. And so on.

Three: The Location of Extraterrestrial Life

1. Possible Locations for Extraterrestrial Life

Let us take a look at the universe surrounding the solar system based on the above stellar and planetary requirements (though they are only necessary conditions and not sufficient conditions). We will use fifteen light-years as a boundary, since any distance beyond that would take hundreds of thousands of years of travel to on even the fastest non-manned spacecrafts.

There are thirty stellar system in this range, ten of which are binary stars and one triple star, so there is a total of forty-two stars. The only star that meets the stellar requirements is the Tau Ceti, 11.68 light-years away. Tau Ceti is a single G-star like the sun; it is yellow in color. The sun's spectral type is G2, while Tau Ceti's spectral type is G8, so it is slightly cooler than the sun (its temperature is 45 percent the sun's temperature), and it stays in its main star sequence for about the same time, which is four billion to six billion years.

These conditions have made Tau Ceti an observation target for scientists. In recent years, astronomers have deduced that Tau Ceti may have five planets with masses two to seven times that of Earth. Among them, the fourth planet, called "planet e," is in the habitable zone; its mass is 4.2 times the mass of Earth. At present, global scientists within the field all regard this speculation with great interest, as the existence of planet e and the possibility of it producing intelligent life all remain to be studied.

In conclusion, stars that can facilitate intelligent life are very rare, and it is even more rare for there to be suitable planets around them. Even if planet e did exist by Tau Ceti in a habitable zone, the probability of it meeting the other precise conditions for producing life are overwhelmingly negative. After all, the existence of a solid rock planet within the habitable zone of a suitable star is only one of the many basic conditions necessary to produce intelligent life.

Today, we can be certain that more planets exist outside of the solar system; only thousands have been discovered since 1995, and most of them are larger hydrogen and helium planets like Jupiter.

We have not yet reached an in-depth level of observation and research regarding these planets; even the existence of planets around Tau Ceti are mere speculation.

Clearly, we cannot determine the location of extraterrestrial life according to planetary indicators; we can only rely on stellar indicators. Only one thing is for certain: planetary indicators will only be more stringent than stellar indicators.

2. The Search for Extraterrestrial Life

On March 2, 1972, the Pioneer 10 space probe was successfully launched into space by NASA. Its mission was to fly out of the solar system, after surveying Jupiter, in search of extraterrestrial life. On June 13, 1983, after crossing Neptune, it became the first man-made spacecraft to fly out of the solar system. An alternative definition of the solar systems stipulates that any area adhering to the solar system's gravitational constraints belongs to the solar system. By this definition, Pioneer 10 still has to travel twenty thousand years before it leaves the solar system. Pioneer 10 carried a gold-anodized aluminum plaque marked with the cosmic positions of Earth and the solar system through multiple neutron stars, human figures of a male and female, and two circles indicating that the simplest material molecules were composed of two hydrogen atoms. This is a calling card of Earth's humans that will last one billion years. It flies aboard Pioneer 10 towards Taurus; two million years later, it will reach the star Aldebaran.

A year later, Pioneer 11 followed its predecessor on April 6, 1973, journeying towards Aquila. It will take about four million years to reach this constellation. On August 20 and September 5 of 2007, NASA launched the two detectors, Traveler 2 and Traveler 1, towards Sirius and Ophiuchus. These two detectors both brought greetings from Earth.

Sending detectors out of the solar system is only one way we deliver information to extraterrestrial life; the more common way is to use radio waves to send messages. In July 2003, with the support of NASA and other authorities, more than ninety thousand "electronic greetings" from more than fifty- two countries around the world flew towards five stars similar to the sun. The former Soviet Union's Yevpatoria Observatory was the first to send a greeting message to aliens as early as November 1962. They used ordinary telegram codes to issue the simple words—"Peace, Soviet Union, Lenin"—into the depths of space.

In November 1974, the world's largest radio telescope was built in Puerto Rico; in celebration, the telescope sent a three-minute telegraphic greeting to the Messier 13 globular cluster. Later, the Yevpatoria Observatory sent greetings to extraterrestrial life two more times in 1999 and 2001. They also sent a music recording of an electric organ concert into space.

The United States' Messaging Extraterrestrial Intelligence (METI) initiative plans to use radio or laser signals to send some "topic factors" to neigh- boring planets by the end of 2018. Then they plan to send signals to planets hundreds or thousands of light-years away; this will be the first time information will be sent clearly and continuously to extraterrestrial planets. The idea is to send continuous greetings towards one target planet for months or years in order to connect with aliens.

People have always had a strong interest in aliens. Not only are we keen to send information to aliens, but we also do everything possible to learn about them. Despite the many efforts to contact extraterrestrial life, so far no reliable evidence of extraterrestrial life has been received.

The UFO phenomenon has always been an unsolved mystery. We have had records of UFOs since ancient times. Many consider these UFOs to be evidence of aliens visiting Earth, but no real proof of alien encounters has been verified. There have been reports of alien sightings and even alien abductions. Logically speaking, such claims probably have very little truth to them. In 2009, the British government announced the closure of their official UFO investigation team due to it being "a huge waste of time and money."

Four: Reconsidering Extraterrestrial Life

Though we have no concrete evidence of alien life and we understand that the conditions required to produce intelligent life are extremely stringent, we are certain that extraterrestrial life exists in the universe. Because the universe is extremely vast, even miracles of the smallest probability can happen.

According to modern astronomical observation and speculation, there are about two hundred billion stars in the Milky Way and three hundred billion galaxies in the universe, putting the number of stars in the universe at billions of trillions. Since the birth of the universe 13.8 billion years ago, stars have evolved through at least four or five generations (first generation star systems cannot produce life). Earth cannot be the only planet with intelligent life during all this time.

Even so, the possibility of alien life visiting Earth and threatening humanity is very small. Due to the exacting conditions required to produce intelligent life, it is unlikely that such life exists anywhere near us, and it would be even more unlikely that they could travel to us.

The power source for interstellar travel alone would be a big problem. The Apollo moon landing spacecraft was only forty tons, but its launch rocket was more than two thousand tons, most of which was propellant fuel. The moon is only 380,000 kilometers away; our nearest neighboring star is more than one hundred million times further than that.

The millions of years interstellar travel requires is another great consideration. A series of technical, physical, and psychological problems must be resolved for such a journey. Moreover, any intelligent person would lack sufficient motivation to carry out such a trip. Millions of generations of evolution and would pass by during this journey, and the end would not justify the means. If intelligent life really did exist, they would most likely choose to send probes or electronic messages towards Earth to satisfy their curiosity, just like us.

Of course, someone might bring up the theory of time and speed from the general relativity theory. If Einstein's formula was completely accurate, it further proves that interstellar travel is impossible, since it shows that time, speed, and weight are interrelated. When an object travels at a speed close to light speed, time will become very slow, while the object's weight will increase.

Once the object reaches the speed of light, its weight will reach infinity. In other words, before humans could reach the speed of light, we would be crushed by the weight of our own bones. There is also no force that could propel such a heavy spacecraft; this has been proven by high-energy particle accelerator experiments.

We also often see “wormhole” travel methods in sci-fi movies. Would that be possible?

The wormhole concept is an inference based on the theory of general relativity. It is also known as the Einstein-Rosen bridge. According to the wormhole concept, time and space can be warped to form a shortcut between distant points, or it could form a shortcut between now and the future or now and the past. Based on this concept, people have proposed ideas of time travel and time machines that can change time and distance at will.

Realistically speaking, the wormhole is still a very immature inference, and it brings up many questions that cannot be answered. For example, some have asked what would happen if a person traveled back in time to kill their mother before they were born, or if wormholes would allow astronauts to return to Earth before they even left. This is clearly illogical. Many aspects of the wormhole theory cannot be solved with current scientific cognition.

Even Hawking, who was always at the forefront of such academic discussion, admitted in his book, A Brief History of Time, that the possibility of time travel still awaits conclusion.

Over the past centuries, we have been committed to finding traces of extraterrestrial visitation on Earth, but no such evidence has been discovered. If Earth could produce simple life-forms 4.28 billion years ago, it would have had basic survival conditions back then. If aliens wanted to occupy, colonize, or vacation on Earth, they should have arrived a long time ago. Since no extraterrestrial life has visited Earth in the past billions of years, we have reason to believe they will not arrive in the billions of years to come. Of course, this is just one type of logical reasoning.

The universe formed 13.8 billion years ago. First-generation star systems cannot produce life, but second-generation star systems should have existed ten billion years ago. It takes about five billion years for intelligent life to form, which means the earliest intelligent life should have formed five billion years ago.

Five billion years is an immensely long time for an intelligent species, so it should have been sufficient time to develop all manners of technology. So why have aliens not visited Earth? I think there are only two possible reasons.

First, the natural laws of the universe make interstellar travel impossible to overcome, even for the most intelligent beings. Since intelligent life can only be produced under very specific circumstances, the instances of such life would be few and far between. Even the alien life closest to Earth would be distant enough to negate the possibility of visitation.

Second, whenever intelligent life is formed, nature will also endue it with inherent flaws. Such flaws will cause the intelligent species to self-destruct before they have time to figure out the logistics of interstellar travel. Also, these life-forms may stop the development of interstellar travel technology for some reason. This will be examined further in this book.

Although the possibility of alien invasion is extremely small, it should not be completely ignored. Two considerations will be proposed here as reference: first, the occurrence of any major event will have warning signs in advance, including alien invasion. We will have time to take precautions accordingly to defend our home planet; perhaps that is all we can do. Second, it is very foolish to devote much research and preparation against alien invasions today. If extraterrestrial life really did invade Earth, they would possess much more advanced technology compared to our hundred thousand years of human history. They would be at least billions of years more advanced than humans; we could not hope to catch up to that in a few thousands or millions of years. Moreover, Earth has possessed suitable living conditions for 4.28 billion years without any sign of aliens, so it would be unnecessary to devote efforts to prepare for something of such minimal possibility within such vast time constraints.

The committed observation of extraterrestrial life is not much of a problem, but the continuous attempts to communicate with and send information to aliens is irrational. According to previous analysis, the possibility of alien visitation is very small, so this conclusion means two things. On one hand, if we cannot connect with aliens, all our efforts will have been wasted. This is too high a price to pay just for the satisfaction of curiosity. On the other hand, if aliens really could receive our information and travel to Earth with unimaginably advanced technology, humanity could be facing overall extinction.

It has been said that it is immoral for us to only detect alien information and not share our information as well. This is a very naive view. We observe aliens out of curiosity and goodwill, but we cannot assume that aliens will share our attitudes. The laws of survival always favor that the strong, highly civilized creatures capable of visiting Earth may not regard us as “people” (we are not the same species, after all) and kill us at will. That could be the end of humanity. Today’s decision-makers and scientists should stop such potentially devastating behavior just for the satisfaction of curiosity or some other purpose.

SECTION FIVE: THREATS FROM EVOLUTIONARY LAWS

One: Inheritance, Mutation, and Evolution

Men produce sperm and women produce eggs. Both are cells. When a sperm cell combines with an egg cell it forms a fertilized egg. Fertilized eggs can split into two exact same cells, which can then split into four, then eight such cells, eventually forming a living person.

The formation of life is the result of cell division. This applies to humans and all other organisms. Why are people different from each other, and why are animals and plants each different in their own way? The secret lies within the biological cells.

There is a substance called DNA in cells; its basic unit is deoxynucleotides, and it stores the genetic code of life. Simply speaking, a cell is made of the central nucleus and the peripheral cytoplasm. There is a very important material called chromosomes inside the nucleus; it is the carrier of DNA, and it always exists in pairs: one half comes from the male parent, and the other from the female parent. This means that half of our traits are decided by the male parent, and the other half by the female parent. Humans have twenty three pairs of chromosomes.

DNA molecules are composed of two long chains in a double helix structure, which resembles a spiral ladder twisted together. The handrails of the ladder are made of phosphoric acid and deoxyribose, which is the backbone of DNA. The steps of the ladder are made of base pairs, and the genetic codes of life are engraved on them. The "genes" we usually refer to as the deciding factors of traits are fragments of DNA. According to results from the Human Genome Project, it is estimated that humans have twenty thousand to twenty-five thousand genes.

The two chains that form the DNA double helix structure are identical to each other but reverse in direction—that is, the two ends of the chain are reversed and wound together in a right-hand spiral. During cell division, the two long chains of the DNA molecules are split to form two separate strands, each of which is paired with other deoxynucleotides to form a new double helix structure. Each newly formed spiral is exactly the same as the original spiral, producing two identical DNA molecules. This is the self-replication function of DNA.

When we say that the DNA molecule self-replicates to form two double spirals exactly the same, we refer to an almost 100 percent accuracy. However, nothing is foolproof, and one accidental error will appear among numerous perfect copies. This is called a "mutation."

On ranches, we sometimes find that cattle or sheep will produce an off spring completely different from its parents; this is an example of mutation. Distinctly different crop seedlings will also appear on farms, which is also mutation. The same phenomenon happens in humans as well. All creatures mutate; some mutations are inherited and some are not. Mutations are usually not beneficial, as they produce weaker individuals. Cancer is one such adverse mutation within the body; radiation syndrome is another example where high-energy rays penetrate into the cell's nucleus and destroys the DNA structure, causing mutation.

In biological mutation, sometimes there will occur a mutation that produces a stronger individual. If this mutation can be inherited, it will form a stronger species. This is what we call evolution. Earth's primitive life developed into the vibrant variety of creatures today through evolution; we humans are a product of evolution as well.

Reverse evolution also occurs in organisms when unfavorable mutation becomes a common phenomenon that can be inherited. This situation can also be called "degenerative evolution," or

“devolution.” Devolution will cause a species to be less adapted for survival and less suited to the environment, and they will usually go extinct after a period of struggle.

All species are evolving, and according to the theory of evolution, all creatures on Earth are descended from the same ancestor. Primitive life mutated differently in different environments, leading to the differentiation of animals, plants, and fungi. These life-forms continued to evolve; the strong survived, while the weak were eliminated in a process we call “natural selection” and “survival of the fittest.” It is also referred to as the law of natural selection; this is one of the most important laws in the theory of evolution.

Two: Reasons for Species Extinction

There are about 2,000,000 species of animals, 270,000 species of plants, and 35,000 species of microorganisms currently recorded, and scientists estimate the total number of biological species (recorded and unrecorded) in the world to be ten to thirty million. However, many more species have existed on Earth. We can almost be certain that the species on Earth today are less than 1 percent of the grand total, as over 99 percent have already gone extinct.

The extinction of Earth’s creatures in the past was mainly a result of natural forces. Life on Earth has existed for 4.28 billion years and gone through numerous extinctions, but life itself has never been interrupted. Since the Cambrian explosion, Earth’s creatures have experienced five major extinction events, the biggest of which was the Permian-Triassic extinction 250 million years ago. During this event, 90 percent of marine organisms and 75 percent of terrestrial life disappeared, yet many species were preserved. We know that since life began, Earth’s environment has never deteriorated so much that no creatures could survive; even during major extinction events, it was only certain creatures that could not adapt.

Through the study of species extinction, it can be concluded that extinction always results from one of these three factors:

1. Environmental Factors

Environmental factors are the changes in the natural environment that cause species’ extinction. The earth’s environment is affected by a variety of factors, like volcanoes, asteroid or comet collision, geomagnetism disappearance, and climate change—all of which change Earth’s environment significantly. Some organisms can readily adapt to changes in the environment, while others may evolve to suit the environment in a gradual process. These organisms survive. Any species that does not fit one of the above conditions will become extinct.

Environmental factors are the main factor in species extinction, especially large-scale extinction. Studies of the five major extinction events show that environmental factors were the main reason every time. It is easy to understand how environmental change leads to mass extinction. Most organisms are exposed to the natural environment and sensitive to environmental change; such

changes will inevitably lead to adaption challenges. Dramatic changes in the environment are especially conducive to extinction.

2. Competition

Competition refers to the extinction caused by stronger species eliminating weaker species, or interdependent species reducing in conjunction. Competition also includes the extinction caused by intraspecific competition. Competition generally only leads to routine extinctions, not mass extinctions.

3. Devolution

Devolution refers to the adverse mutations a species might suffer when there are no environmental or other external factors that may affect the species. These adverse mutations are hereditary, leading to a devolution of the species as a whole.

Once the devolution of a species becomes an irreversible trend, it will become increasingly difficult for the species to survive. They will be continuously eliminated until the species goes extinct. Devolution usually leads to routine extinctions.

Three: Threats from Evolutionary Laws

Evolutionary laws act on all species, including humans. All species are subject to the ruthless laws of extinction, adapting, or going extinct accordingly. Does this mean that human beings might also become extinct from natural forces?

1. Threats to Humans from Environmental Factors

Most organisms are exposed to the elements and adapt to environmental changes in a very simple manner. If global temperatures drop, animals evolve thicker skin and longer fur; if global temperatures rise, animals evolve thinner skin and shorter fur. Those who cannot adapt this way face extinction.

Additionally, due to the food chain relationship between species, the extinction of one species will inevitably lead to the reduction or extinction of other species that prey on it. Since animals have no way to process their food apart from chewing, they cannot change inedible species into an edible food source. Though digestive systems can evolve, few species complete such evolution. Animals obtain food from nature; they cannot domesticate and breed food, so changes in nature will affect their food source significantly.

Humans are not in this situation because their intelligence has reached an absolute high ground, and humans have mastered far more advance technology. Humans interact with the natural environment in a completely different way.

Humans are no longer exposed in nature; we mastered the use of animal skins and fire tens of thousands of years ago. Today, things are even more optimistic; we can adjust to the outdoor temperature by changing clothes, and we can adjust to temperature indoors with heating and air conditioning. We can even design specialized clothing and work facilities for extreme temperatures.

In regard to the environment's impact on human food sources, we have an unparalleled advantage over other animals. Millions of years ago, humans learned to crush shells with stones and eat the nuts. Later we learned to use fire to cook raw food. Ten thousand years ago, humans learned to domesticate poultry and plants, far surpassing other animals.

Today we have greenhouse vegetables and fruits to eat in winter; we can change the genes of crops to cultivate temperature-resistant, pest-resistant, disease-resistant crops; and we can breed all manners of livestock in all kinds of weather.

Humans are also an omnivorous species. Plants and animals—cooked or raw—are all suitable food sources for us. This makes it much easier for humans to solve the problem of food shortages when environmental changes occur.

Does this mean the environment does not have a decisive influence on mankind? Of course not. The previous sections of this chapter have outlined environmental impacts that may threaten humanity; however, an environmental threat that could lead to human extinction would be one that could completely collapse global ecology. It would be far beyond normal environ mental change. The nearest threat that would threaten human survival is the threat of the sun evolving into a red giant, but that is too far in the future to consider today.

2. Threats to Humans from Competition

Powerful dinosaurs once ruled the Earth. Let us use this to make a hypothesis: if dinosaurs and humans existed on Earth simultaneously today, which would dominate the other? I think the answer is clear—humans would dominate the huge dinosaurs, not the other way around.

An empty-handed man encountering a wolf in the wild will be torn to pieces, let alone if he comes across a dinosaur. However, humans as a group—especially highly intelligent humans who have mastered high-tech means—have unparalleled strength.

It is certain that no species on Earth could destroy the seven billion humans today through competition. From an evolutionary perspective, mankind would not allow any species to evolve enough to threaten human survival. Humans are completely capable of controlling plant and animal evolution on Earth—enough to ensure they never become threats to humanity. Microorganisms are the most difficult to control, as they are so small in size and vast in number, new viruses and bacteria can unexpectedly attack humans. Malignant infectious diseases are especially terrifying; however, the infectious disease control and treatment methods we possess

today are enough to limit this threat within a certain range and prevent it from causing too much harm to humanity.

There are facts to support our capability. The Black Death of the Late Middle Ages killed half of Europe's population, but Milan was saved from the catastrophe because the bishop of Milan ordered all patients, dead or alive, to be kept behind walls and buried. Later scientific development coined this effective method as isolation, and it is one of the most effective means to treat epidemics.

In 2003, a highly infectious and highly malignant infectious disease called SARS broke out in China. Due to the convenience of travel, this disease spread to more than thirty countries throughout the five continents in only two months. People were terrified of SARS; however, countries applied effective inspection and isolation methods and curbed its spread after only five or six months, even though there was no effective drug treatment. Ten thousand people were infected in the end, and the death toll was less than one thou sand. If this had happened one hundred years ago, the situation would have been much deadlier.

The antibiotics and drugs we now have are effective enough to treat most new diseases. Though our treatment of SARS was not especially effective, it was good enough to deal with the situation. We can be sure that although diseases brought on by microorganism evolution will cause some death and harm, the modern methods we have mastered can prevent them from destroying humanity.

3. Threats to Humans from Devolution

The devolution here refers to the devolution of human beings—that is, whether human beings will devolve due to irresistible genetic mutations resulting in extinction. For example, we might stop reproducing, or our intelligence may decrease until we become common animals, or some other type of devolution might occur.

According to the principle of evolution, the more an organ is used, the more it will evolve. Humans are the only creatures that use their brains to adapt to the environment; thus, humans' brain capacity will only become more developed. In terms of creativity, human creativity has been steadily growing with no signs of stagnation or regression. As long as our intelligence does not devolve, humans are fully capable of dominating Earth and adapting to the environment continuously.

Even if humans did start devolving intellectually and physically in the future, the gene re-engineering technology we currently have would be enough to save ourselves after some development. Gene re-engineering refers to a technique that cuts, pastes, and repairs the genes on DNA using enzymes. This technology has already been widely used. Scientists can turn cotton red, yellow, or brown; they can produce seedless watermelon and seedless grapes; they can make frogs grow six eyes; and they can stop rats from growing tails. All this is the result of gene re-engineering.

If we wish to, humans can re-engineer their own genes in the near future. The Human Genome Project has conducted a comprehensive study and sequencing of the twenty thousand human DNA genes formed by three billion base pairs and has achieved considerable results. As biological science develops more in the near future, it is entirely possible that we will find out all about human genetic structures and genetic life codes. With a little more effort, humans will be able to freely re-engineer themselves.

We are pleased to see that current technology has succeeded in saving many endangered species. For example, British scientists have launched a plan to freeze and store the DNA of endangered species, and Chinese scientists have successfully cultivated the endangered yew tree and protected the endangered giant panda, Chinese alligator, crested ibis, and so on.

It is clear that any species mutation will not happen all at once. If we found signs of human devolution in the future, we would be fully capable of using bioengineering technology to prevent such adverse mutations, and we would have ample time to prepare for such an event. Therefore, devolution is not a factor that will lead to human extinction.

To sum up, if we use the sun's evolution into a red giant in five billion years as a boundary, there are no factors in nature that will cause human extinction. In terms of natural chance, we have a long future ahead of us. This can also be proven through the survival of other species. Sixty-five million years ago, dinosaurs survived on Earth for 160 million years. Humans are stronger and smarter than dinosaurs and much more capable of adapting. It is only logical that humans will survive much longer than dinosaurs. Relative to the history of dinosaurs, we are yet in the infancy of our development. The idea that we have hundreds of millions of years ahead of us is just logical reasoning.

Chapter Four Generally Recognized Internal Threats

The internal threats to humans correspond with the external threats, and they are equally ominous. Humans are intelligent, but also emotional; we are able to discern many complex things, but we can also be influenced by our emotions and take irrational actions.

We have always been aware of the self-threat humans pose to themselves, but this knowledge is far from profound or objective. The self-threat (or internal threat) we discuss here is only the portion that has been generally recognized. We will analyze these factors in order to find the internal elements that truly pose a major threat to the overall survival of mankind.

SECTION ONE: THE KILLING OF EACH OTHER

While mankind's intelligence has far surpassed that of other animals, we have retained many negative animal features, especially intra-specific competition—that is, the killing of each other. Furthermore, humans kill their own species with much more cruelty and on a far larger scale than any other type of animal. War and criminal homicide are the two main forms of such internal killing.

One: War

Any person with common sense knows that war has existed since the birth of mankind. There has been war as long as there has been human society. When we flip open history books, we find the pages filled with war. Not only are there written records, but most oral legends center around war as well. It is a basic historical fact that human society goes hand in hand with war.

According to the theory of evolution, intra-specific competition exists in all species. In animal species, the losing party will usually run away, and the victor usually allows this escape. Although deaths do occur, they are not the norm. Human struggles are very different. Since humans possess far superior intelligence, they will often take intra-specific competition to the extreme. Humans can predict the future and take preemptive attacks; humans can organize large forces to combat stronger enemies; humans can manufacture weapons of mass destruction; and humans have far more complex psychology that can breed generations of hatred and fury.

Of course, humans first evolved from ordinary animals, so the earliest human struggles were not much different from those of animals. War was a product of human society's scientific and technological development.

The history of human warfare can be summed up in three points. First, the scale of war is increasing exponentially; second, the brutality of war escalates continuously; and third, the weapons of war have become more and more advanced.

As there have only been five thousand years of recorded history, the earliest scale of war can only be estimated through experience. A tribe has a few thousand people at most, meaning that only a few hundred or one thousand people would participate in war. For a war of such scale, one or two hundred casualties would be an astronomical number.

The formation of countries changed everything. The first city-states had an average population of thirty-five thousand people, making it possible to mobilize thousands or tens of thousands of war personnel. Therefore, tens of thousands of people would be engaged in battle, allowing the casualties to rise into the thousands. A casualty of one or two hundred people would signify a mild battle.

War was an important factor in the expansion of countries. The purpose of war was not only to obtain wealth, but also to conquer territories. Rulers hoped to expand the country through such conquests, since the larger a country was, the greater its strength and resources would be, thus ensuring it a better chance at victory in the next war. As countries continued to expand, the scale and brutality of war expanded accordingly.

Two thousand years ago, during Qin Shi Huang's war to unify China, over one million troops were deployed, and hundreds of thousands died as a result. Alexander the Great eastward conquest deployed hundreds of thousands of troops as well.

As war is a matter of life and death, any country will first apply its most advanced technology in warfare. The earliest wars took place during the Neolithic Age when people used stone knives, stone axes, and flint arrows in war. In the Bronze Age, the rarity of bronze meant that it was seldom used in agriculture or production, but mostly used to produce bronze swords, spears, and armor. Similarly, chariots were used in war shortly after the invention of the wheel.

Iron smelting technology was relatively advanced during Qin Shi Huang and Alexander's time, and most of the weapons and armor of that time were developed in iron. Siege ladders, battering chariots, and war chariots were used in large quantities.

During the cold weapons era, wars not only grew in scale, but also in brutality; weapons grew more advanced as well. Battles also increased in length: a feature unique to the cold weapons era.

During this era, weapons were less efficient and had limited impact. The fastest transportation at the time were horses, who had limited speed and needed time to rest and graze, thus limiting the speed of advancement. As wars continued to expand in scale, low efficiency of weapons coupled with low transportation speeds caused large-scale wars to draw on for a lengthy period of time. The Crusades lasted nearly two hundred years, and the Mongolian conquest continued for ninety years.

The characteristics of war changed as gunpowder became widely used in warfare. This change happened gradually. The use of firearms, stone cannons, lead guns, and iron cannons was not the decisive factor. It was the use of explosives that changed the situation. Explosive bombs could

cause mass casualties, and they did not distinguish between soldiers and civilians. Therefore, weaponry efficiency was greatly improved and civilian casualties started to rise. Wars became more brutal as they shortened in duration. After entering the gunpowder era, even large-scale wars did not last more than twenty or thirty years, and wars that lasted centuries disappeared completely.

After the Industrial Revolution, a number of scientific and technological innovations emerged and were applied to warfare. As war became increasingly short and more brutal, it also further escalated in scale. As humans entered the twentieth century, technical conditions matured enough to facilitate world war. The telegraph was invented in 1844, and the telephone was invented in 1876, forming the basis for communication in world warfare. The car was invented in 1886, and aircrafts were invented in 1903, facilitating conditions for world war transportation. Once these conditions became available, it was in the nature of mankind to launch a world war.

In July 1914, the First World War broke out, involving over thirty-three countries from all over the globe and 1.5 billion people—two-thirds of the global population at that time. Over seventy-three million troops were mobilized; among them, twenty-nine million were directly engaged in warfare, ten million were killed, and twenty million were injured. A war of such large scale and such mass-casualty would have taken more than one hundred years to fight during the cold weapons era, but World War I only lasted four years.

Only twenty-one years after World War I, a larger and more brutal world war broke out. World War II lasted six years and involved more than 1.7 billion people from over sixty countries; 110 million troops were mobilized, more than 55 million people were killed, and even more were injured. Both the scale and casualties of this war set unprecedented records. In addition to the widespread use of guns, cannons, tanks, warships, submarines, and aircraft carriers, chemical weapons, biological weapons, and nuclear weapons were also deployed. A large number of civilians were killed in this war, and the aftermath was devastating.

Though no outbreak of world war has happened since World War II, localized war has never ceased. The number of deaths caused by war has surpassed twenty million—more than twice the casualties of both world wars combined.

The continued development of science and technology has successfully sent humans to space, and the study of nuclear weapons is no longer in the development stage. The US is no longer the only country with nuclear capabilities. According to simple calculations, the world's nuclear warheads could destroy humanity many times over. As genetic engineering continues to develop, genetic bio-weapons that are even more lethal than nuclear weapons have appeared. The variety of precision guided missiles, nuclear submarines, strategic bombs, and other forms of technology could send these destructive weapons to every corner of the earth.

Based on current warfare technology, if a third world war broke out, it would be larger in scale, even more brutal, and shorter still in duration. Moreover, this war would almost certainly spread to

space. If nuclear weapons, genetic bio-weapons, and intelligent robots were all used, the number of casualties could reach billions in a matter of months.

Two: Criminal Homicide and Terrorism

Criminal homicide can be divided into a variety of categories, such as robbery homicide, revenge killing, and so on. Terrorism is an extreme form of homicide; it is not only large in scale, but it also has great effect on the social order at large; thus, terrorism will be a main topic of discussion within criminal homicide. When it comes to acts of terrorism, it is often difficult to distinguish between war and crime (particularly organized terrorist attacks from terrorist groups). We are classifying it as criminal homicide for easier discussion.

Terrorism has existed since the dawn of human society; assassination attempts were earlier forms of terrorism. However, terrorism has expanded far beyond just assassinations, bombings, hostage-takings, and armed attacks. Terrorist attacks that caused large-scale casualties were rare in ancient times. To be precise, large-scale terrorist attacks have only started to occur frequently in recent decades, especially in the past twenty years. Terrorism has become one of the most serious threats to global security.

Analysis of terrorist attacks shows that contemporary terrorism has the following four main characteristics:

1. It seeks the largest casualty and most dramatic sensation. Terrorist attacks often aim to kill as many civilians as possible in order to maximize public reaction.

2. It uses the most extreme means. Terrorists usually employ the most brutal and lethal tactics within their abilities.

3. It disregards personal life and death. Many terrorists will choose suicide attacks as their method, showing no consideration for their own life.

4. It goes against human morals. Terrorists often target the weakest parts of society—those who most people of conscience would seek to protect.

In the infamous “9/11” attack, nineteen Islamic religious extremists hijacked four commercial planes in the United States. Two planes crashed into the New York World Trade Center buildings, one crashed into the Pentagon US Department of Defense building, and the other planned to crash into the White House. The attack caused a total of three thousand deaths and disappearances.

In the 1995 Tokyo subway sarin attack, cult organization Aum Shinrikyo released sarin gas into a subway during peak hours, causing twelve deaths and over 5,500 injuries.

In September 2004, thirty Chechen terrorists abducted over 1,200 hostages from a school in Beslan city; 330 were killed, and over 500 were injured, most of which were children.

On July 22, 2011, a Norwegian man detonated a car bomb near the executive government office in Norway before opening fire on a youth league summer camp in Utøya. This lone wolf terrorist killed seventy-seven people all by himself.

In recent years, ISIS has been organizing terrorist attacks all over the world. The November 13, 2015, Paris attack alone resulted in 132 deaths and 300 injuries. Terrorist attacks mainly stem from economic and political purposes, or they are derived from hatred and psychopathy; the latter three are the most brutal and large-scale.

The hatred that leads to terrorist attacks can be hatred for individuals, or for society; it can be ethnic hatred, religious hatred, or national hatred. Terrorist attacks caused by hatred are sometimes related to the psychopathy of the terrorists, such as psychopathic disdain of society. Such attacks are usually perpetuated by individuals who stab people in the streets, hijack planes, or blow up buildings. They are usually isolated events that cause great harm but are relatively minor compared to other more organized terrorist attacks.

In spite of this, if such perpetrators obtained specialized weaponry, these isolated attacks would become much more destructive. These terrorists are usually desperate individuals who want revenge on the entire society, even at the cost of their own lives. Speaking in the extreme, if such people could master a means of destroying the world, they would not hesitate to do so.

National, religious, and ethnic hatred are often aligned with political purposes. Before Israel was founded, the Jewish people initiated frequent terrorist attacks in the Palestinian territories, both out of ethnic and religious hatred and in the hopes of eliciting support by alerting the international community. Palestinians initiated frequent suicide bombings and armed attacks in the Israeli-occupied areas out of a combination of national hatred, ethnic hatred, religious hatred, and political purposes.

Analysis of attacks like this show that terrorist attacks motivated by national, ethnic, and religious hatred as well as political agenda are usually large in scale, meticulously organized, and highly destructive. The aforementioned 9/11 attack, Beslan school siege, and ISIS attacks all belong within this category.

In recent years, large-scale terrorist attacks have intensified exponentially. On one hand, this is due to the increased conflicts between nations, ethnic groups, and religious organizations in our society. On the other hand, such attacks are facilitated by the rapid development of science and technology since the Industrial Revolution.

Before the Industrial Revolution, the means of killing were primitive and inefficient. The Industrial Revolution sped up the development of science and technology, and the inventions produced were always first applied as means of massacre. A variety of new weapons emerged, and all sorts of new technology provided abundant conditions for terrorist attacks.

Newly invented bio-toxins, chemical gas, and potent explosives all increase the destructive effect of terrorist attacks. One of the most popular terrorism targets, aircrafts, are also used widely as a result of scientific and technological developments.

As long as nations, ethnic groups, and religions exist, organized, large-scale terrorist attacks cannot be eradicated. As science and technology continue to develop, terrorists will be better equipped with increasingly terrifying weapons of mass destruction; however, it is likely that the most dangerous terrorist attacks of the future will not be the ones motivated by political purposes or national, ethnic, and religious hatred. After all, such attacks are limited to clear specific enemies—they are not aimed against their own countries, ethnic groups, or religions.

The increased development of science and technology will eventually cause high-tech weapons of mass destruction to fall into the hands of ordinary people. At that time, those terrorists motivated by a personal hatred of society will become the most devastating and dangerous type of murderer. Terrorists like this are undiscriminating in their hatred. They target all of society and don't think to spare even their own parents, wives, or children. When people like this can easily obtain and use weapons of mass destruction, the attacks will be unimaginably terrifying.

SECTION TWO: ENVIRONMENTAL ISSUES

Environmental issues concern both the present and the future. They decide whether our future generations can live long, safe, and happy lives on Earth. These issues arose mainly due to industrialization and then were further amplified, encompassing more aspects of life. In this section, we will elaborate on some of the most important aspects of environmental concerns.

One: Global Warming

Global warming is one of the most discussed environmental issues today. Research shows that though global temperature has been relatively stable for thousands of years, Earth's temperature has been rising steadily at an unprecedented rate for the past century. A series of observations has highlighted the gravity of the situation and garnered widespread concern from all over the world.

The Antarctic continental shelf is narrowing and huge icebergs are cracking off at an alarming rate. From January 10 to January 12 in 2017, one of the largest icebergs in history broke off from the Antarctic Larsen C ice shelf. The iceberg composed 12 percent of the Larsen C ice shelf and weighed about one trillion tons with an area size of over 5,800 square kilometers, making it roughly the size of Shanghai. Additionally, glaciers at river sources are retreating rapidly as well. In the past decade, the Yangtze River and Yellow River have experienced several thousands of kilometers of glacial retreat at their river source in the Qinghai-Tibet Plateau; the Alps, long famous for their beautiful snow views, have also started to experience snow shortage on their ski slopes.

Greenland and the Arctic Ocean ice shelf are also undergoing significant retreats. It is estimated that summer Arctic sea ice has reduced 72 percent from 1980 to 2016, reaching an all-time low in

October and November of 2016. Scientists estimate that the summer Arctic Ocean may be completely ice-free within the decade; if so, it will be the first time the Arctic is ice-free in one hundred thousand years.

The permafrost in the United States' Alaska and Canada's Wood Buffalo National Park has also begun to melt due to global warming, and similar things are happening in Russian Siberia as well. In March of 2017, scientists discovered more than seven thousand dirt mounds in the Siberian Arctic area, each the size of a small hill and containing explosive methane inside. A number of spray mouths had also formed.

Global warming threatens humans on a multifaceted level. Take glaciers, for example; the influx of water from melting will lead to years of floods followed by serious shortages in water. People who live nearby and depend on major rivers will be seriously affected.

Glacier melting will also lead to sea levels rising. According to several scientists, since coastal areas have denser populations, one billion people will be threatened globally with every one-meter rise in sea level. Some countries located in low terrains may be swallowed completely. 40 percent of the Maldives and 60 percent of Tulu Lu have already been submerged by water. If the sea level does rise two or three meters by the end of this century as predicted, the inhabitants of these countries will face terrible consequences.

Global warming has also brought about natural disasters like we have never encountered in the past. The El Niño and La Niña phenomena are two such cases. Global warming also has a direct impact on human bodies. High temperature and humidity levels are ideal for the proliferation of parasites, bacteria, and viruses, which can lead to a significant increase in infectious diseases. Historically, most plagues and epidemics have happened during hot summer seasons; tropical rainforest countries are especially susceptible to such attacks.

The temperature of the earth is mainly determined by the sun. Sunlight is filtered to Earth at a rate suitable for human habitation, due to the existence of the Earth's atmosphere. The sun's temperature remains on the surface of Earth through a complex process, which we can simplify this way: solar radiation is partly absorbed by Earth and partly reflected back into space. When Earth re-radiates solar energy, it changes the nature of that energy and produces infrared radiation. This is the origin of heat. If all this infrared remained on Earth, Earth's surface would be very hot; if all of it were reflected back into space, the Earth would freeze. A precise portion of infrared radiation must be retained to maintain a suitable temperature on Earth's surface; this process is accomplished by the atmosphere.

The main components of Earth's atmosphere are nitrogen and oxygen. They are transparent and allow light to pass through freely; however, some other elements of the atmosphere are not transparent, like carbon dioxide, methane, ozone, and water vapor. They not only absorb infrared radiation but also produce it, causing Earth's atmosphere and surface temperatures to rise. These gases are known as greenhouse gases. Even though they comprise only a small portion of the atmosphere, they have an extremely important role. Today, the average temperature of Earth is

15 °C; without greenhouse gases it would drop to -20 °C. If Earth's atmosphere was covered in green- house gases, the surface temperature would rise to 200 °C. If either of the two above situations occurred, global ecology would be completely destroyed and humans would no longer be able to survive on Earth.

Global warming happens for many reasons. Natural causes take place gradually and usually reach some sort of balance in the end; however, in the two hundred years since the Industrial Revolution, humans have burned large quantities of oil, coal, natural gas, charcoal, and firewood. This, coupled with forest and grassland fires, has caused massive carbon dioxide discharge. Plant absorption of carbon dioxide can no longer keep up with its production, causing the carbon dioxide concentration in the air to rise steadily and resulting in the greenhouse effect. The greenhouse effect exacerbates constantly. Global warming leads to permafrost thawing, which releases methane into the atmosphere. Methane produces an even stronger greenhouse effect than carbon dioxide.

After repeated appeals from scientists, the reduction of greenhouse gas emissions to prevent global warming was finally put on the world's agenda. The United Nations held a number of meetings to urge countries to reduce their greenhouse emissions, but they met great resistance. Industrial countries in particular held negative attitudes towards these negotiations. After decades of effort and global consensus, the Paris Agreement (or Paris Climate Accord) was finally adopted on December 12, 2015, at the Paris Climate Change Conference. It was signed on April 22, 2016, in New York. This day was marked as "World Earth Day" and celebrated as an extraordinary moment in human history. Over one hundred countries gathered at the United Nations to witness the signing of the Paris Agreement.

Only one year later, on June 1, 2017, newly appointed US President Donald Trump announced a withdrawal from the Paris Agreement in deference to his "Americans First" national strategy that prioritized the US economy and employment issues. The United States' withdrawal from the Paris Agreement caused a global uproar, and many major countries voiced their objections. Unfortunately, nothing much can be done, since the United States is the world's only superpower.

Two: Acid Rain and Air Pollution

In the 1850s, people discovered sulfuric acid in rainwater at the industrial city of Manchester. Scientists called this type of rain "acid rain." The term became widely used and over time expanded to acid mist, acid snow, and acid ice. Normally, rain is slightly acidic due to the presence of carbon dioxide in the air; it is a normal phenomenon, but acid rain has an acidity ten times that of normal rain.

Acid rain is caused by air pollution and is a product of industrialization. Since the Industrial Revolution, the burning of fossil fuels for industrial production has caused sulfur dioxide and nitrogen oxides to be released into the air. Once these particles encounter rain, they are converted into sulfuric acid and nitric acid, which then form acid rain.

Acid rain is harmful in many ways. In recent decades, many lakes in Western Europe and North America have suffered major fish shortages due to the acidity of the lake water. Forests in Central Europe have withered away due to acid rain erosion, and large stretches of grassland in Russia have disappeared for similar reasons. Acid rain filters the nutrients from the soil and reduces the fertility of the land; it wreaks havoc on crops as well.

Once the concentration of acid rain reaches a certain level, metals like lead, aluminum, and cadmium become soluble in acid, so acid rain will affect human health after entering the human body through drinking water. Acid rain can also enter the human body through other means, such as the ingestion of fish from acid rain-affected lakes, which could cause poisoning. Acid rain can also corrode building materials like metal, paint, and marble.

Air pollution not only threatens humans through the production of acid rain, but the emission of smoke and dust into the air is also harmful.

Acid rain and air pollution once plagued early industrialized countries; however, as regions like China, India, and Southeast Asia focus more on their own industrialization processes, acid rain has shown a trend of moving from developed countries to developing countries.

In 2013, “haze” might have been the keyword of the year for China. In January of that year, haze enveloped over thirty Chinese provinces four times; the capital, Beijing, only experienced five days without haze. Haze is a visual barrier caused when the dust, sulfuric acid, nitric acid, and other particles in the air form an aerosol system. Once it encounters rain, it forms acid rain.

Air pollution has a serious effect on people’s health and quality of life, and the social outcry against this issue has become especially strong. In 2017, “defending blue skies” was written into Premier Li Keqiang’s government work report.

Acid rain and air pollution have attracted more and more attention globally. Many countries list them as the object of major scientific research projects. The United Nations has also held a number of meetings to discuss these issues, and many useful declarations and conventions have been produced. In 1979, the United Nations Economic Commission for Europe signed the Convention on Long-Range Transboundary Air Pollution (CLRTAP), which went into effect in 1983. This was the first regional convention concerning air pollution, and it contributed greatly to the control of acid rain. However, as long as industrial production keeps up its expansion for the foreseeable future, control measures will only be able to alleviate harm—they cannot fundamentally solve the problem of acid rain and air pollution.

Three: The Loss of Biodiversity

There are about ten to thirty million biological species living on Earth today; only about 2.3 million of them have been identified, and most have not yet been classified. All these species together constitute Earth’s ecological chain; their existence is the basis of Earth’s ecosystem.

In accordance with the laws of biological evolution, existing species will die out and be replaced by new species in a constant cycle. This is a normal process, but the interference of mankind has changed everything. By destroying the natural evolutionary process of creatures, we are causing biodiversity to decline.

The importance of biodiversity is first manifested in ecological value. All earthly creatures relate to one another. Plants absorb moisture, carbon dioxide and inorganic salts from the soil, and air to produce photosynthesis under light. But they also alter the physical properties of soil and release oxygen and moisture into the atmosphere to achieve a balance. An adult needs 0.75 kilograms of oxygen every day, so human beings could not survive without the oxygen production of plants.

Plants are the food source for herbivores, and herbivores are the food source for carnivores. Bacterial microorganisms decompose animal bodies and plant leaves to produce simple inorganic matter like carbon dioxide and water, which are in turn absorbed by plants as nutrients. Ecology is balanced in such a cycle; each creature has its own unique irreplaceable role within the cycle. The extinction or major decline of creatures will destroy this ecological balance; studies show that the extinction of one species usually endangers the survival of twenty other species.

Biodiversity is also important in terms of economic and medicinal value. Human existence is heavily reliant upon biodiversity. Our everyday necessities cannot be maintained without the variety of creatures, and many of our drugs are derived from animals and plants. Human beings would not survive without biodiversity.

Life originated in the ocean, but after organisms came to land they expanded to account for more than 99 percent of the global biomass. Biodiversity on land is mainly focused in tropical rainforests; nearly 90 percent of the world's species lives in tropical forests, and 75 percent of the world's birds have breeding grounds there. Therefore, the protection of forests—especially tropical forests—is essential to the conservation of biodiversity. Unfortunately, today's global forest coverage is reducing at a rate of fifty thousand square kilometers per year, 80 percent of which are tropical forests. As these forests are destroyed, many unique biological species are declining rapidly as well.

Humans are also destroying biodiversity with the extensive use of pesticides, air pollution, water pollution, and other industrial waste pollution. When pesticides kill insects, they also kill birds and frogs. DDT has even been found in Antarctic penguin bodies.

Once rivers are polluted by nitrogen, phosphorus, and other man-made organic materials, algae will breed in large numbers, consuming the water's oxygen and producing toxic, gas-like hydrogen sulfide. Aquatic organisms and fish cannot survive in such conditions; this is what we call the eutrophication of water. When water eutrophication occurs in the ocean, it is called a red tide. In the past three decades, red tides have appeared all over the world and caused coastal fish, shrimp, and shellfish to die in large numbers; coastal fishermen have suffered heavy losses as a result.

Human hunting of wild animals is also a major cause of biodiversity loss. Although African governments have expended great efforts to curb the smuggling and trafficking of ivory and rhino horns, the killing of wild elephants and rhinoceros has not stopped. The smuggling of rare wild animals has always been an important component of international crime. In China, Vietnam, Cambodia, and other East Asian and Southeast Asian countries, wild animals are regarded as delicacies.

Profound reflection reveals that since the Cambrian explosion 530 million years ago, the five major extinctions on Earth have all been caused by natural forces like glacial arrivals, asteroid impacts, global warming or cooling, and frequent volcanic activities. The last major extinction occurred 65 million years ago; shortly after that, biological species recovered to peak numbers. Today, species are declining at a rapid rate once again, and all signs indicate that the earth is experiencing a sixth extinction period—one caused completely by human activities.

Scientific research shows that human intervention has caused a rapid increase in the rate of species loss, especially since the Industrial Revolution. The Global Environment Outlook (NOC) published by the United Nations Environment Program (UNEP) in October 2007 pointed out that the current rate of species extinction is one hundred times that of fossil records; many scientists believe the number should be one thousand times. The Industrial Revolution might have brought great material wealth to mankind, but it devastated the earth's species. In July 2006, scientists from thirteen countries published a joint article in Nature magazine. The article mentioned that 12 percent of Earth's birds, 23 percent of Earth's mammals, 25 percent of pine and cypress plants, and 32 percent of amphibians were facing extinction. That number would increase by 15 percent to 37 percent over the next fifty years.

The largest animal population humans have seen to date is the passenger pigeon. They were migrant social animals that lived in the Americas and once reached five billion in number. The largest group of passenger pigeons had over two hundred million members and could obscure the sky during flight.

This spectacular species became extinct due to human activities in a matter of decades.

In the 1870s, immigrants flocked to the west of North America, cutting down the forest habitats of passenger pigeons and hunting them for food and sport. After three or four decades, only a few dozen passenger pigeons were left in zoos. People finally began to repent and started carefully feeding the passenger pigeons in captivity. Sadly, passenger pigeons were migratory animals that were accustomed to living in large groups, so they could not survive in small numbers inside cages.

The last passenger pigeon was called Martha; she died on September 1, 1914, at 1:00 p.m. People recorded the exact time of her death and built a tomb for her. It read: "Human greed and selfishness has led to the extinction of passenger pigeons." This was the first time humans truly mourned the extinction of a species.

Mankind's history has been one of killings and extinctions. Humans set foot on New Zealand eight hundred years ago; today, most of their larger animal species and 60 percent of their bird species have gone extinct.

Humans arrived in Australia fifty thousand years ago; since that time, over 90 percent of the larger animal species living there have disappeared. Huge animals like the Diprotodon that had survived here for 1.5 million years and withstood ten glacial periods could not survive the catastrophe brought by humans.

We are biologically classified as Homo sapiens; many other members of the Homo genus were eliminated after encountering us. Homo Erectus, Homo heidelbergensis, and Neanderthals had all survived for hundreds of thousands—or even millions—of years on Earth. Why did they all become extinct after the arrival of Homo sapiens? So-called climate change and species devolution were not sufficient reasons; the main cause was massacre by Homo sapiens.

Fortunately, biodiversity has received wide attention from the international community today, and multiple meetings have been held by the United Nations. In particular, the Convention on Biological Diversity (CBD) was signed in 1992 at the UN Conference on Environment and Development. It was followed by a series of conferences to implement specific objectives of the convention.

The Convention on Biological Diversity is a legally binding global agreement; it marked the first time a consensus was reached concerning the importance of biodiversity to mankind. However, different countries have differing levels of awareness and value attached to the convention, and implementation efforts vary widely. In addition, many fundamental issues like forest, grassland, and wetland destruction, as well as pollution issues, have not been solved; thus, the trend of biodiversity loss has not changed so far, and the foreseeable future is not promising.

Four: Destruction of the Ozone Layer

From Earth's evolution history, we know that early Earth creatures survived in the ocean until four hundred million years ago when the formation of the ozone layer allowed life to move onto land. The ozone layer is crucial in protecting Earth's creatures from harmful rays.

Oxygen generally consists of two oxygen atoms, while ozone is composed of three oxygen atoms and exists in the stratosphere ten to fifty kilometers about Earth's surface. The ozone layer formed from the surplus oxygen produced by marine microbes in a three-billion-year period; therefore, the original process of life formation on Earth was a lengthy process.

Earth's atmosphere is 99 percent composed of oxygen and nitrogen; the other 1 percent contains many other types of gas, and carbon dioxide is one of them. Ozone is only a very small percentage of the atmosphere.

Many of the rays in the universe—especially those radiated from the sun—are detrimental to life. If humans flew in space without protective devices, they would be killed by these rays very quickly. These rays are blocked before reaching Earth's surface due to the existence of ozone in the stratosphere. Ultraviolet light is one of the most lethal rays, and 99 percent of it is absorbed by the ozone layer. Human survival is inseparable from the protection of the ozone layer.

Sadly, the ozone layer, which took over three billion years to form, has been seriously damaged by mankind in the past few decades. In 1956 and 1957, scientists discovered ozone holes above the Antarctic; these holes expanded rapidly and have covered the entire Antarctic continent, even extending to the ocean around the Antarctic Circle. In 1987, ozone holes were also discovered atop the Arctic and showed signs of expanding as well.

The main reason for ozone reduction has been identified: Freon. Freon was invented by the DuPont company in the 1930s. It does not burn and is non-toxic, very stable, and non-corrosive on metals. This not only makes it ideal for the refrigeration industry, but also for foaming agents, sprays, cleaning agents, disinfectants, and other products. However, it is the stability of Freon that makes it so detrimental to ozone.

As a refrigerant, Freon can be divided into two categories: chlorofluorocarbons and hydro chlorofluorocarbons. Chlorofluorocarbons are very stable and will not decompose as they float upwards to the stratosphere. Once chlorofluorocarbons encounter unfiltered ultraviolet light in the stratosphere, the chlorines inside will decompose into atoms and combine with less stable ozone to produce chlorine oxides and oxygen; thus, the ozone layer becomes damaged.

This is only the beginning of ozone destruction. Chlorine oxide and free oxygen atoms will also combine to form chlorine and oxygen, which repeats the process, resulting in a vicious cycle. Once the process starts, a chain reaction is initiated. It is estimated that one chlorine atom can destroy one hundred thousand ozone molecules, and its destructive force can last a hundred years.

For this reason, the United Nations Environment program held a special meeting in Montreal, Canada, in 1987. At this meeting, the Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) was signed. It limited the production and use of chlorofluorocarbons and seven other types of products that cause damage to the ozone layer. A number of amendments have been made to this protocol, and most of the world's major countries have participated in the treaty. The Montreal Protocol is considered to be the most successful collaboration of humans on environ- mental issues.

In fact, the control of ozone-depleting substances like chlorofluorocarbons has received rather desirable results. Even so, it is estimated that ozone holes will not be completely repaired until the late twenty-first century, even in the most ideal circumstances.

SECTION THREE: RESOURCE PROBLEMS

One: The Depletion of Non-Renewable Resources

Many of Earth's resources are renewable. Fresh water flows into the sea and evaporates into rainwater; animals feed on plants and inhale oxygen, while plants absorb carbon dioxide and release oxygen. Nature maintains a cycle. Both water and plants can be regenerated. Animals can be regenerated as well, and so can wind energy, solar energy, hydroelectric energy, and other energies. Even though humans overuse these renewable resources, they can be restored after a period of recuperation. Even animals and plants can recover as long as we do not kill them all. That is the characteristic of renewable resources.

Not all resources function like this. Substances like coal, oil, natural gas, and other fossil fuels—as well as natural materials like gold, silver, copper, iron, tin, graphite, mica, and crystal—cannot be regenerated. These resources are called non-renewable resources.

The fear of resource depletion has existed for a long time, but it used to be limited to individual or regional resources. The general sense of resource crisis has only hit human society in the past century.

Since the Industrial Revolution, skyrocketing industrial production and the rapid rise of cities has increased the demand on non-renewable resources. Iron and steel smelting requires the burning of wood or charcoal; the increased demand of steel after the Industrial Revolution caused many forests to be cut down until the growth of forests could no longer keep up with the demand of the steel industry. At that time, the mountains near British steel plants were razed bald, prompting the British government to encourage coal usage instead. As the Industrial Revolution spread from Britain to the Americas and other parts of Europe, coal consumption increased dramatically.

The large-scale use of oil came much later. Crude oil was first successfully drilled in Pennsylvania in 1859, but it was not viewed as a serious resource. At that time, oil was mainly used to extract kerosene for lighting, and gasoline was discarded as a useless by-product. With the widespread use of petrol engines, diesel engines, and cars in the early twentieth century, oil underwent substantial change. Gasoline and diesel became the main products of oil. At the same time, the demand for oil increased dramatically, until it replaced coal as the most important fuel.

The crisis of oil resource depletion arose shortly after the widespread use of oil. Exploration of oil reserves indicated that it could not meet the rapid growth in oil demand. In the 1920s, it was estimated that the world's total oil reserve would only last for another twenty years; however, it was later discovered that the actual oil reserve was more than people estimated, and oil did not dry up in the 1940s.

After World War II, large oil fields were discovered in the Middle East— enough to meet the needs of human use for a limited time. That time was estimated to be around thirty years. Although thirty years have passed without the exhaustion of oil, oil depletion and energy depletion in general have become major concerns around the world. Oil is particularly indispensable to our lives, and it has become a necessary guarantee for a country's economic growth.

As the global economy continues to expand and the global population continues to grow, the rate of non-renewable resource consumption has also increased. The rational and controlled use of non-renewable resources has become an important global agenda. Resources like oil have become strategic materials to major powers and are regarded as a matter of national security.

How long can non-renewable resources last us? Many organizations around the world have dedicated in-depth and detailed study into this issue, and a variety of different research results have been produced. After consolidating these results, a relatively optimistic estimate assesses non-renewable resources in the following way:

Earth's oil can only meet usage demands for less than 130 more years. Verified reserves of other resources show that: coal will last 210 years; natural gas 170 years; iron 154 years; aluminum 215 years; copper 41 years; lead 40 years; mercury 36 years; nickel 44 years; tin 30 years; phosphate 90 years; and salt 300 years.

The above assessment data is certainly not 100 percent accurate, but it reflects an accurate conclusion—if the current trend of development is maintained, the earth's non-renewable resources will face general depletion in less than two hundred years.

My personal view is a bit more optimistic. Many metal and non-metallic materials can be recycled, and as recycling technology improves, the use of resources will undoubtedly be extended. On the subject of oil, natural asphalt can also be used for oil refining as an alternative to crude oil. In recent years, the United States has made major technological breakthroughs in oil shale mining and refining, and China has made breakthroughs in combustible ice mining as well. These will all extend the years of the use of oil. In addition, there are lots of untapped resources on Earth that may exceed our imagination. That is why I believe resources will not be exhausted for a long time, especially metal and non-metallic materials.

Nevertheless, even the most optimistic view is not long-term. Oil, coal, natural gas, and other fuels cannot last more than a few centuries (and most people think this is too optimistic of an estimate), according to current consumption rates. What will our descendants do in a few hundred years?

Coal was formed when ancient plants were buried underground and underwent ground pressure and geothermal reaction; oil and natural gas were generated similarly when ancient marine life was buried under the sea. The formation of all these resources took millions of years, and Earth's current resource reserve was built up over a period of billions of years. It has been mere centuries since we have mastered the use and mining of such resources, yet we have depleted them considerably. How will we account to future generations?

People have only come up with two answers: First, scientific progress could come up with alternative products, like nuclear energy and synthetic materials. Second, new technology could enable mining and resource extraction from extraterrestrial planets.

It is argued here that the two above “solutions” are just excuses for the unregulated exploitation of non-renewable resources. Firstly, many resources cannot be completely replaced; some of their traits may be replaced by alter- natives, but it is impossible to replicate them entirely. Secondly, before technology reaches an ideal level, the use of alternative products will increase cost exponentially. Thirdly, it may take a long time before the mining of extraterrestrial resources is advanced enough to provide for humans. If we blindly used Earth’s resources based on a mere fantasy and deplete all of Earth’s reserves before accomplishing extraterrestrial extraction, human civilization will suffer critically. Moreover, if Earth’s resources can be depleted by industrialized humans in a matter of centuries, how long would the surrounding planets last us? The solar system only has four solid rock planets. Earth is the largest, and Mercury and Venus’ surface temperatures make landing impossible. The only planet that we could use is Mars, and it is only one-tenth the size of Earth. Our satellite moon is even smaller.

Two: Water Scarcity

Water is the source of life; life cannot exist without water. The earth has a huge amount of water—about 1.4 billion cubic kilometers. However, only 2.7 percent of this massive water reserve is fresh water—only about thirty- eight million cubic kilometers. Moreover, most of Earth’s fresh water exists in the form of ice in glaciers, which account for over 77.44 percent of all fresh water. The Antarctic continent and the Arctic Greenland account for 97 percent of all glacier water; the Antarctic continental ice shelf has an average thickness of 1,700 meters, with the thickest parts reaching 4,000 meters. After glacier storage, groundwater accounts for 22.01 percent of freshwater; the remaining 0.55 percent of fresh water exists in rivers, lakes, the soil, and the atmosphere.

Rivers, freshwater lakes, shallow groundwater, soil water, and small amounts of brackish water are the relatively easy to use water resources that humans depend on, but they are a very small portion of the global water reserve. Total global water evaporation is equal to total global precipitation, measuring about 500,000 cubic kilometers per year; 430,000 cubic kilo- meters of ocean water is evaporated every year, 390,000 cubic kilometers precipitates back into the ocean, and 40,000 cubic kilometers is transported to land. Land water evaporation is about 70,000 cubic kilometers, while the precipitation is 110,000 cubic kilometers. The net precipitation amount is provided by ocean water evaporation.

The annual net precipitation of land water is allocated as follows: 28,000 cubic kilometers flow into the ocean, 5,000 cubic kilometers flow through no man’s land, and only 7,000 cubic kilometers can be used by humans. Due to the large number of human water conservancy constructions in the past decades, reservoirs control 2,000 cubic kilometers of water, making the yearly amount of water available for human use 9,000 cubic kilometers. This figure is 0.00064 percent of the total water reserve of Earth, and 0.024 percent of global fresh water reserve.

According to the data, in a moderately developed country, every person requires 350–450 cubic meters of water annually; thus, it is estimated that Earth’s fresh water can support twenty to twenty-five billion people; however, that is not the case. The seven billion people on Earth today

constantly feel the pressure of water shortage. According to data released by the United Nations Education, Scientific and Cultural Organization (UNESCO), nearly nine hundred million people worldwide cannot obtain safe drinking water, and the deterioration of water quality has seriously affected the ecological environment and human health. More than 2.5 billion people live in environments without basic sanitation facilities. In addition, an estimated 1.5 million children under the age of five lose their lives annually due to unsafe drinking water, unsafe sanitation, or unsafe personal hygiene. The number of people who die from water pollution every year surpasses the total number of people who die from violent conflicts.

The reasons for water shortage can be summarized into the following aspects:

First, the distribution of water resources is uneven. Some countries and regions have abundant water resources, while others are severely lacking. For example, the per capita annual freshwater of Canada is 92,000 cubic meters. The Republic of Congo has a population of less than three million and an abundance of rivers—including the large-flow Congo River—allowing its inhabitants to enjoy an annual per capita freshwater amount of 291,000 cubic meters—first in the world. In contrast, the United Arab Emirates in the Middle East only has 71 cubic meters of per capita freshwater annually, making it the world's most water-scarce country. Kuwait has basically no fresh water resource of its own.

The distribution of freshwater in the same country is often uneven as well. The annual per capita freshwater of China is 2,200 cubic meters, making it a rather water-poor country to begin with. However, the annual per capita freshwater of the northern regions is only 25 percent of the southern region. The capital, Beijing, has less than 300 cubic meters of freshwater per capita annually; that's less than some of the dry countries in the Middle East and by the Sahara Desert.

Second, water pollution renders some water unusable. Water pollution can be caused by industrial pollution, agricultural pollution, and domestic pollution. Among them, industrial pollution is the most serious. At present, more than four hundred billion tons of sewage is discharged annually, resulting in more than five thousand billion tons of water being polluted.

Third, water resources are often managed poorly and unreasonably. The low utilization rate and poor management of agricultural irrigation have the most serious impact on water resources. Agricultural irrigation water accounts for about 85 percent of total global water use.

Fourth, the increase in global population is the leading cause of water scarcity. Since the Industrial Revolution, improvements in medical technology have increased population growth at an unprecedented rate. In the past century, the demand for food in China and India alone has increased five times, thoroughly overwhelming world water resources.

Fifth, global warming has led to changes in the global ecology. Global warming causes the world climate to be generally arid while melting glaciers; the El Niño and La Nina phenomena further reduce usable freshwater. Not only do seasonal rainstorms and floods not produce usable water, but they also lead to many disasters.

Water shortage has become a worldwide problem, and the UN has held many meetings to discuss the problem. On January 18, 1993, the 47th session of the UN General Assembly denoted March 22 as “World Water Day.” The United Nations and many countries around the world have taken numerous measures to solve the water scarcity problem, but no remarkable results have been achieved yet.

Three: Desertification

Desertification refers to land degradation in arid, semi-arid, and sub-humid arid areas due to climate variability and human activities, as well as other causes. Desertification renders land unsuitable for the growth of crops and other plants. Land desertification, salinization, and other land degradation phenomena are all part of desertification.

Desertification is a historic issue. We can see from satellite photos and spacecraft overviews of Earth that the ancient breeding grounds of human civilization are the most serious desertification areas. The Mesopotamian plain between the Euphrates and the Tigris rivers, the Nile River in Egypt, the Ganges River in India, and the Yellow River Basin in China are all such areas. However, desertification has never been as serious as it is today. According to the United Nations Environment Programme, 35 percent of global land area has been, and is expected to be, affected by desertification. Desertification has claimed 55 percent of the land in Africa, 19 percent in North America and Central America, 10 percent in South America, 34 percent in Asia, 75 percent in Australia, and 2 percent in Europe. Desertification is a serious threat to the survival and development of mankind, especially in developing countries.

There are three main causes of desertification: First is wind erosion, or wind-driven soil erosion phenomenon. The second is water erosion, which happens when water drives soil erosion. In these circumstances, loose soil caused by reduced vegetation will be washed away by rain, thinning the soil layer and decreasing the fertility of the land. The third is soil salinization, which occurs when moisture evaporates in arid and semi-arid low-lying areas where groundwater is shallow, causing salt to precipitate until the soil achieves salinization.

Earth’s soil is formed over years of precipitation from rock weathering and organic matter. One centimeter of cultivatable land requires twenty to one thousand years of precipitation; however, about twenty-five billion tons of soil is washed away by rain every year, and the desertification and salinization of land upsets the balance between soil “production” and human and natural destruction of land; thus, global land acreage is increasingly unable to meet the needs of human survival.

The reasons for desertification can be traced to humanity’s unrestrained demand on the earth. Many forests were cut down to make room for agricultural farming, resulting in serious soil erosion. At present, about thirteen million hectares of forest are transferred to other uses or disappear from natural causes every year—larger than the land area of Ireland.

The destruction of grasslands is just as bad, mainly in two respects. First, many grasslands are converted to farmland; second, many existing grasslands are overgrazed and degraded. Analysis shows that the destruction of forests and grasslands and the extent of desertification in developing countries are much higher than those of developed countries.

Land salinization is most serious in India, China, Pakistan, and Bangladesh. As a result of the surge in population and the reduction in per capita land area, these countries have had to over-cultivate existing land and use fertilizers and pesticides on land that is not suitable for cultivation. After two or three decades of this type of farming, the land inevitably reaches salinization and can no longer be used.

The rise in global warming due to greenhouse gas emissions is also an important cause of desertification. The rise of global temperatures will lead to two kinds of climate phenomena: global drought, and seasonal rains and floods. Global droughts increase the salinization and wind erosion of land, while seasonal rains and floods increase soil erosion. Both of these climate phenomena lead to land desertification.

Desertification is directly endangering more than 110 countries from all over the world. The threat it poses to the survival and happiness of mankind can be imagined. The seriousness of this problem has aroused the concern and attention of the international community. The United Nations has exerted considerable effort in this regard and has formed the United Nations Convention to Combat Desertification.

Regrettably, the issue of desertification has not been mitigated by the efforts of the international community so far. Since the signing of the United Nations Convention to Combat Desertification, the involved parties have been convening every two years to facilitate the implementation of the Convention. However, the Convention encounters much difficulty, especially in regard to the fulfillment of funds and establishment of corresponding mechanisms. In fact, global efforts on combating desertification have not made substantial progress to this day.

SECTION FOUR: ISSUES OF POPULATION AND POVERTY

One: Population Explosion

On October 31, 2011, the United Nations Population Fund (UNFPA) identified a baby born in Kaliningrad as the seven billionth member of the world. This came only twelve years after the “six billion population day” in 1999. It took only twelve years for the world’s population to increase one billion, making the annual population increase close to one hundred million. This growth rate is known as population “explosion.” It not only makes the world uneasy, but also highlights the grimness of the situation.

According to historians and archaeologists, human population in the Paleolithic era was only 120,000 to 150,000; in the agricultural period, the world’s population was about five to ten million. This growth process took two million years. After entering the Industrial Age in the middle of the

eighteenth century, the world's population was close to eight hundred million. It took ten thousand years to progress from the agricultural period to the industrial age. Today the world's population is more than seven billion, and it has only been two hundred years since the Industrial Age. This growth trend informs us that technological revolution is the root of population explosion. Logical inference would assume that the wealth brought on by techno- logical revolution would facilitate more food and better conditions for raising children; therefore, wealthier people would have more children, and higher- income countries would experience faster population growth. The truth is just the opposite.

The emergence of antibiotics and chemical drugs as well as the overall improvement of health care greatly reduced infant and child mortality rates. Average life expectancy increased generally as well. However, beliefs in reproduction and contraception did not update accordingly.

The development of agricultural technology has further secured food production; this coupled with the development of world charity has greatly reduced large-scale famines. And with more than seven billion people as the population base, even millions of hunger-related deaths could not balance the annual population growth. As a result, the population is growing faster and faster, enough to be called a population explosion.

Studies of world population growth trends reveal two obvious pat- terns—namely, the poorer the country, the higher the population growth rate; and the less educated the women, the more children they give birth to. This is because the concept of birth control was not accepted by the poorer countries and individuals when the Industrial Revolution spread the fruits of medical technology developments to the rest of the world.

As long as advanced medical technology was adopted by a society, it would produce appropriate treatments for disease, reduce death, and prolong life expectancy. Contraception was a personal matter. Individuals had to accept this value and believe in it to produce the corresponding effect.

Throughout human existence, people have faced threats from the plague, disease, hunger, and war. Families had to reproduce in large numbers to ensure the survival of the bloodline. This idea became deeply rooted in the minds of people and even became a strong component of some national and cultural identities. Once people were better educated, they developed a better understanding of medical technology and their own role in contraception. For poorer, less educated people, such ideas were much harder to comprehend.

In addition, the poorer a person is, the less life security they will have. Poorer countries often have inadequate social security systems. When a person produces children in these circumstances, they will often take into account old age and loss of the ability to work. If the society cannot guarantee their basic life needs, they would need to rely on children for support. This is a driving force for having more children. In wealthier countries where social security systems are sound, and among wealthier people who feel secure in their future, this is not a concern.

Together, the many troubles that arise in poorer countries are the third important factor that lead to higher reproduction rates. In cases of turmoil, war, and political instability, the government has no time to educate the public and propagate contraception. Some of the poorer inhabitants cannot even afford food, let alone contraceptives.

The population problem attracted the attention of the international community early on. As the world's resources are limited, population growth has the potential to overwhelm Earth in a serious way. The United Nations has held a number of meetings concerning population growth, and some countries have adopted measures to control population growth and received some results. But the world's population is still growing at a rapid pace. In 2002, the United Nations published the "Global Population Profile: 2002," predicting that by 2050, the world's population would reach a maximum of 9.3 billion. However, this number is on the rise. In June 2017, the United Nations Economic and Social Council issued a forecast stating that by 2050, the world's population would reach 9.8 billion and continue to grow to reach 11.2 billion by 2100.

Two: Poverty and Wealth Inequality

Population explosion and poverty are two issues that are related yet independent of each other. According to a report by the Boston Consulting Group, 45 percent of the world's wealth is in the hands of 1 percent of the global population. This ratio has been rising continuously. The report further predicted that by 2021, the proportion would reach 51 percent, meaning that 1 percent of the world's people would possess more than half of the world's wealth.

According to the Global Wealth Report 2016, issued by the Credit Suisse Research Institute in November 2016, the majority of the population— which accounts for 73 percent of the total population—has only 2.4 percent of the world's wealth, while the rich—who account for 10 percent of world's population—possess 86 percent of the world's wealth.

The rich keep getting richer, and the poor keep getting poorer. At the same time, the income gap is widening both within and between countries. At the beginning of the nineteenth century, the ratio of the real per capita income of the rich compared to the poor in the world was 3:1. By the beginning of the twentieth century, this ratio had been extended to 10:1, and by the beginning of this century, the ratio had exceeded 60:1.

According to a statistics report by the International Monetary Fund, the richest country in 2016—Luxembourg—had a per capita GDP of 10,399 US dollars, while the country that ranked 191st —South Sudan—only had a per capita GDP of 233 US dollars. While the richest people in the world are rolling in money, annual global death caused by hunger and malnutrition has reached five million.

Why did the Industrial Revolution and technological progress fail to bring wealth to the majority and bring poverty and disappointment instead? There are numerous reasons, but only two main direct causes: first, there exists an inequality in world trade. The main export products of poorer countries are primarily basic products derived from agricultural goods and non-renewable

resources, as well as labor-intensive manufactured goods. These products have very low added value to begin with, and the rules of world trade are in the hands of developed countries. Trade barriers and high tariffs make it increasingly difficult for these countries to export, allocating them lower and lower shares in the international market.

The second cause lies in the lack of scientific and technological creativity. This is far more crucial than the former. Since the Industrial Revolution, today's poorer countries have lagged behind due to colonialism, war, civil strife, and a variety of other reasons. In the face of the ongoing third Industrial Revolution, these countries simply cannot compete with developed countries in terms of material, human, financial, and other resources. The gap in scientific and technological creativity is particularly huge. This inevitably leads to a further distance between poorer countries and developed countries.

Wealth inequality (or the wealth gap) is not only reflected between countries but is also displayed prominently within countries. On the one hand, this is due to the rapid development of science and the adoption of information technology. Production has become more dependent on mechanical equipment and scientific instruments rather than direct human labor. That is why developed countries have consistently high unemployment rates even as their economic development skyrockets. On the other hand, the rapid development of science and technology will inevitably allow the shareholders and senior managers who have emerged victorious among competitors to gain more wealth, while the majority of people get poorer in comparison. The unemployed people in countries with good social security systems can rely on social relief to maintain survival, but in countries with less adequate social security, the unemployed will descend into extreme poverty.

The UN has been committed to the eradication of poverty in the world, and poverty has been cited as the first of the three main themes of social development identified by the United Nations. The UN has also devoted itself to the Millennium Development Goal for poverty eradication. In September 2000, the United Nations Millennium Summit set "reduction of half the world's extreme poverty and hunger by 2015" as one of the UN Millennium Development Goals (MDG). According to the United Nations MDG Report 2015, the number of people living in extreme poverty has dropped from 1.9 billion in 1990 to 836 million in 2015, basically achieving the goal of halving the world's extreme poverty.

Before the 2015 MDG expired, the UN Development Summit held in September passed a new series of goals for 2015–2030. The new agenda includes seventeen sustainable development goals and 169 specific development goals. The first of the sustainable development goals is to "end poverty in all its forms everywhere." The eradication of extreme poverty in all the world's population by 2030 is the first component of that goal.

SECTION FIVE: THE CONFUSION BROUGHT BY SCIENCE AND TECHNOLOGY

As science and technology brings material comforts to humans, they also bring a series of problems. Some scientific and technological achievements have even seriously endangered the survival and happiness of humanity and come into direct conflict with human values. This has led

to some confusion and reflection regarding the validity of such achievements; however, this confusion and reflection is generally limited to specific scientific and technological achievements.

One: Nuclear Weapons

Nuclear weapons were developed based on Einstein's theory of mass-energy equivalence. According to this theory, one gram of matter releases energy equivalent to twenty thousand tons of explosive TNT. In order to prevent Hitler's Germany from developing the atomic bomb first, US President Roosevelt accepted a proposal by a group of scientists led by Einstein and formally approved the Manhattan Project to conduct atomic bomb research. In the summer of 1945, the first three atomic bombs were created. At this point, as the Second World War was nearing its end, one of these three bombs was used in a test explosion, while the other two were dropped on Japan's Hiroshima and Nagasaki.

These two atomic bombs not only completely destroyed the buildings of Hiroshima and Nagasaki, but they also impacted numerous people. At the time, Hiroshima had a population of 280,000 people. The bomb killed 71,000 people and injured 68,000 on the spot. Later, radiation and other related conditions caused the deaths of 120,000 people. Of the 200,000 people in Nagasaki, 35,000 died immediately, and 60,000 were injured directly in the explosion. Later, 74,000 died and 75,000 were injured due to radiation and other sequelae.

Nuclear weapons mainly cause damage to people through optical radiation, shock waves, nuclear radiation, radioactive contamination, and electromagnetic pulse. Apart from electromagnetic pulse, the four other kinds of injury can all cause death. At the moment of nuclear explosion, the temperature at the center of the blast can reach tens of millions of degrees. The light from the explosion is more dazzling than a thousand suns, and the scorching temperature can change steel into gas. The blistering explosion storms will also destroy all life in their path; the huge shock waves sometimes even destroy buildings and take lives dozens or even hundreds of kilometers away.

Nuclear radiation is a more silent killer. It exists in the form of harmful rays released from nuclear explosions. In serious cases, these rays can cause immediate death; in mild cases, they can cause headaches, dizziness, nausea, hair loss, mild bleeding, and gastrointestinal disorders. Nuclear radiation often has latent effects and can lead to cancer, leukemia, and other diseases.

Radioactive contamination is caused by the large amount of radioactive dust generated by nuclear explosions. These dust particles contain a variety of harmful rays that affect the human body in a way similar to nuclear radiation; however, these effects will last much longer. After the atomic bomb explosions in Hiroshima and Nagasaki, many people were injured through nuclear radiation and radioactive contamination when searching for and treating others, as they didn't understand the dangers posed.

Atomic bombs use nuclear fission to release energy. Many countries have also developed hydrogen bombs that rely on the release of hydrogen nuclear fusion energy. Hydrogen fusion has

the advantage of being highly efficient—hydrogen releases four times more energy than its equivalent in uranium, and it is not affected by critical mass, making the explosive force of the hydrogen bomb theoretically infinite.

After successful hydrogen bomb tests, countries developed neutron bombs to deal with specific targets, like tanks. They produced electromagnetic bombs to target communication facilities, and shock bombs aimed towards hard targets. Together, these constitute the third generation of nuclear weapons.

Today, not only do the five permanent UN members have nuclear weapons, but many other countries, including India, Pakistan, Israel, and North Korea, have them as well. Many more countries possess nuclear capabilities. It is estimated that nearly seventy countries in the world have the technical and economic ability to develop nuclear weapons.

Looking back now, the first three atomic bombs were mere playthings. Their power was only equivalent to ten thousand to twenty thousand tons of TNT—utterly primitive compared to the nuclear arsenal of today. The largest nuclear experiment to date was a hydrogen bomb exploded by the Soviet Union on October 30, 1961; its power rivaled fifty-six million tons of TNT.

By 1986, the United States, the Soviet Union, the United Kingdom, France, and China possessed a total of seventy thousand warheads altogether—equivalent to fifteen billion tons of TNT. After the Cold War, nuclear warheads were destroyed in large numbers, but fifteen thousand still exist in the world.

What would happen if the world broke out in nuclear war? Scientists and scholars from all over the world have reached a common understanding. Since the power of the explosion is concentrated and not evenly distributed, nuclear war would not destroy all of mankind. After the initial massive nuclear explosions, billions of people would die, and the smoke and debris from the explosion would blanket the sky, blocking the sun. In a period of weeks or even months, sun exposure would be greatly reduced and global temperature would drop sharply to 10 or 20 below zero (Celsius). This is what we commonly refer to as a “nuclear winter.”

A nuclear winter would seriously affect Earth’s ecosystem and greatly impact crop production. Many people would die from the extreme cold and food shortages. The loss of energy, electricity, running water, medical care, communication, and other essential life systems would drive survivors into panic mode, and as time went by, they would become increasingly numb and desperate. Nuclear radiation and radioactive dust would destroy the internal organization of human bodies; hospitals would be overcrowded with patients, and most would die in extreme pain. Nuclear explosions would also damage the ozone layer so that people would face strong radiation from ultraviolet rays after the darkness lifted. Many new illnesses would hit.

Human civilization would be devastated, and it would be extremely difficult to recover. Hunger, cold, disease, and fear would rob humanity of basic dignity, and literature, art, and music would become meaningless. Humanity would revert back to primitive foraging days, and it would take

many years for the social order to re-form. Some have even asserted that nuclear war would destroy human civilization, leaving no chance for recovery.

Two: Biochemical Weapons

Biochemical weapons are a collective reference to biological weapons and chemical weapons. Many experts believe that biochemical weapons have the potential to be even more lethal than nuclear weapons. Nuclear weapons destroy life and structures in earth-shattering explosions, but biochemical weapons snuff out life silently and without a trace. Due to the lower manufacturing cost of biochemical weapons, they are sometimes called the "atomic bombs of poor countries." This also makes them a popular attack tactic for terrorist organizations.

1. Chemical Weapons

Chemical weapons were first use by the German army in World War I. The Allied Powers retaliated in kind, and both sides repeatedly used poison gas thereafter.

Chemical weapons have a variety of different agents and can be divided into three main categories. The first category is the neurotoxic agent. Such agents can penetrate the human body and quickly combine with human choline enzymes to destroy their vitality. They can inhibit nerve impulses and produce muscle spasms, thus paralyzing the respiratory muscles, leading to death of humans and animals. Organic phosphorus poison—known as the king of modern poison—is one such chemical agent.

The second category is the corrosive agent. This kind of poison can seriously damage human muscle tissue cells and will cause blisters and corrosion to appear at any point of contact. Victims will suffer painful blisters, corrosion, eye photophobia, and respiratory mucosal necrosis. Mustard gas (double chlorine ethyl sulfide) belongs to this category.

The third category is asphyxiating and hemolytic agents. These agents mainly destroy human and animal respiratory systems. They prevent cells from absorbing oxygen in the blood and damage the lungs, causing death through pulmonary edema. Phosgene and diphosgene are some such examples.

Chemical weapons are not only brutal weapons of warfare, but they are also perpetrators of terrible aftermaths. After World War II, over 120,000 tons of chemical weapons were discarded offshore in the UK, polluting over 100,000 square kilometers of ocean and land. Every year, gas bombs left by the Japanese army are discovered in China. Two million gas bombs have been discovered in the northeast region alone, and many people have been poisoned as a result.

2. Biological Weapons

Compared to chemical weapons, biological weapons are even more harmful, lethal, and brutal.

The core of biological weapons lies in biological agents, which refers to a variety of infectious disease pathogens. They are able to self-propagate and transmit disease.

The starting number of biological agents is usually very small, but pathogens are able to propagate rapidly, and silently invade the human body. Once an outbreak occurs, the damage is vast and long-term. Soldiers and civilians will suffer alike from this weapon that is basically an artificial plague.

Bio-agents are usually composed of microorganism too small to see. At present, we know of about 160 kinds of pathogenic microorganisms. They can be divided into six categories in terms of harm and transmission: bacteria, viruses, chlamydia, rickettsia, toxins, and fungi.

The descriptions of bio-weapons are often nerve-wracking. Under certain conditions, one gram of infected Q rickettsia chicken embryo tissue can disperse into micron-sized aerosol particles and infect more than one million people; twelve eggs infected by Chlamydomonas can infect all of humanity; inhalation of one single Q rickettsia particle can cause Q fever infection.

Biological weapons also cause lasting damage. Cholera bacteria can survive for more than forty days in appropriate conditions; yellow fever virus can be stored for three to four months in appropriate conditions, and biological toxins can cause disease as long as they survive.

Due to the lethal nature of biological weapons, their use is generally condemned, and no large-scale bio-weapons have been released to date. One of the more notable uses of bio-weapons was by the Japanese army in China during World War II when the Unit 731, formed by the Kwantung army surgeon, General Shirō Ishii, tested bio-weapons on human subjects. During a period of twelve years, the Japanese army repeatedly used biological weapons, causing the death of 270,000 Chinese people. The transmissible nature of bio-weapons affected the Japanese as well; it is estimated that one thousand Japanese soldiers died as a result of their own bio-weapons.

The development of genetic technology means that the lethality of modern transgenic toxins has far exceeded that of traditional biological toxins. Genetically modified toxins use transgenic technology to re-combine the DNA molecules of different biological toxins to form new bio-toxins. Transgenic technology can combine all the attributes of existing bio-toxins as well as manufacture new forms of bio-attack, and it can also produce super bio-toxins that target specific organs, races, or sexes.

The lethality of genetically modified toxins is a whole new concept com- pared to that of traditional toxins, and it can be thousands or even millions of times more lethal. Some have calculated that a few hundred tons of genetically modified toxins could replace the hundreds of thousands of tons of bio-toxins existent today.

Three: Cyber Crime

At midnight on June 20, 1980, the computer at the Command Center of the US Strategic Air Command in Omaha suddenly issued signals indicating an attack from Soviet nuclear submarines and intercontinental missiles. At the same time, corresponding large screens started showing the measures to be taken in reaction to a nuclear attack. Duty officers immediately pressed the alarm button and issued an alarm to all air force strategic forces using code words.

The president of the United States was notified of the situation at once, and Air Force One was prepared for takeoff. Five minutes later, 153 strategic missile launch units entered their positions, 1,054 intercontinental ballistic missiles carrying nuclear weapons readied for launch, 100 B-52 strategic bombers prepared for takeoff, and the E-4 Airborne Command Post was airborne.

Soldiers waited nervously for counterattack commands, only to receive word that alarms were being lifted and that the whole situation had been caused by a computer virus. A massive cyber joke had been played on the top decision-makers of the United States.

When the 1991 Gulf War was in full swing, a Dutch teenager broke into the US Department of Defense's computer system and released many of the Ministry of Defense's confidential materials. He also modified the contents of the computer system extensively.

In the internet age, information leaks occur frequently. In 2016, more than ten million people had their personal information leaked more than fifteen times. According to incomplete 2016 statistics, over 6.5 billion pieces of personal information were leaked in China's black market alone, meaning every Chinese person experienced an average of five leaks.

The world's computers suffer virus attacks every day, and hundreds of thousands—or even millions—of computers are paralyzed by viruses at a time. Cyber criminals also extort through computer viruses. The largest cyber extortion attack to date occurred in May 2017. At the time, a ransomware entitled "WannaCry" attacked computers from at least 150 countries and encrypted all their files. Ransoms ranged from hundreds to thousands of dollars in bitcoin, and files were deleted in a week if the ransom was not paid. The hacker also threatened to raise the ransom with time.

Only a few months passed before a new computer ransomware attacked computers in over sixty countries. Local enterprises, ports, airports, and urban management suffered greatly. Some organizations estimate that these two computer viruses alone caused more than $8 billion in losses.

The internet has only been developing for forty years, yet cybercrime has become a widespread phenomenon. Cyber criminals set up financial frauds, marriage traps, and gambling traps. They also set up logic bombs that cause entire system programs to fail; the possibilities for disaster are endless. States, organizations, businesses, schools, research institutions, and even families have to devote much effort to prevent these attacks. Judicial institutions, police, and security agencies have devoted increasing amounts of human, financial, and material resources to dealing with cybercrime. Many agencies have even set up special anti-cybercrime departments. Cybercrime

and computer pranks are causing serious harm to human society; they have become a major public hazard.

Chapter Five Human Nature and Threats

In the previous two chapters, we discussed the external threats that threaten humanity, as well as generally recognized self-threats. This chapter will review and reflect on these threats to ascertain the most important factors that endanger humanity and seek corresponding solutions.

External threats exist objectively; they have nothing to do with human nature or social systems. They exist whether we want them to or not. Self-threats are a different matter. They are largely decided by human nature and human social systems. In order to reflect on the threats we pose to ourselves, we must first understand human nature and the main social systems.

SECTION ONE: RE-ANALYZING EXTERNAL THREATS

Based on our previous analysis, we can re-analyze external threats on a new level. It may be beneficial to rise above the issue of external threats itself and look upon the future of humanity instead.

One: Accepting the Extremely Unlikely

We all know that external threats like disease are almost impossible to avoid, as is individual death. The only thing we can do in the face of such threats is to calmly accept. Individual death does not threaten the whole species; contrarily, humanity would not last long if humans lived infinitely.

Accepting individual death is a matter of common sense. Although most people are reluctant or afraid of death, they do accept the reality of illness and old age. However, any normal person would not be able to accept the extinction of humanity. As members of the race, it is only logical that we value overall human survival above all else.

Previous discussion has made it clear that many external threats can endanger the survival of humanity, such as black holes, antimatter planets, close-up supernovas, and alien invasion. Any one of these could be the end of mankind. The question is: Will we really encounter them?

There are only two lethal external threats that will definitely befall us and cannot be solved with current technology—the end of the universe, and the sun's evolution into a red giant.

Existing cosmological theory has determined that the universe must come to an end, but that day is trillions of years in the future. We are completely helpless in the face of this threat, and all of our current solutions are still within the realm of scientific fantasy; therefore, it might be wiser to leave this problem up to the more intelligent future generation.

At five billion years, the evolution of the sun into a red giant is also sufficiently far off in the future. Though it is impossible to deal with or even take precautions against such a threat today, we can hope that humans five billion years in the future will be better equipped to handle the situation. It is possible that future humans will be capable of moving away and building a new home elsewhere in the universe once the sun becomes a red giant.

Before the sun evolves into a red giant, there may be two other threats that could end humanity: asteroid collision and human devolution. However, humans already possess the ability to guard against these threats. The possibility of an asteroid collision large enough to destroy Earth is quite minimal. Some further development in astronomical observation, nuclear technology, aerospace technology, and missile technology would be enough to predict and resolve this issue.

The possibility of human devolution is somewhat higher. It is inevitable that some human organs will devolve after long periods of reproduction and threaten human survival. This day may be far in the future, but it will come sooner or later. Fortunately, the genetic engineering technology we have mastered today is enough to imagine the prospect of genetic re-engineering as a solution to this problem; thus, our future is still looking very optimistic.

Our optimistic estimate here has ruled out external threats like black hole swallowing, stellar and independent planet collision, micro-black holes, antimatter planets, and alien invasion. This is because these threats are all either purely theoretical speculation, as yet unconfirmed, or exponentially low in probability.

The abovementioned threats are all impossible to prevent or avoid with current technology, and solutions are not likely to be found in the foreseeable future either. If such unlikely coincidences really do occur, humanity can only accept them as they are.

Conversely, there is no need to expend too much energy on combatting these extremely unlikely circumstances. Mankind has many things to accomplish before the sun evolves into a red giant, so it would be unwise to divert our attention to such theoretical possibilities. Especially since it is unlikely that we would receive satisfactory results even if we did focus on these matters. Therefore, calm acceptance is the only reasonable attitude towards such things of extreme unlikeliness that are also infinitely difficult to surmount.

Two: Determining Reasonable Precautionary Periods

Threats that endanger human survival and happiness are bound to transpire, so it is only reasonable that we consider corresponding prevention methods. Such external attacks will only occur as isolated events at specific points in time, so it would be a huge waste of resources to maintain constant vigilance at all times. Moreover, a constant state of preparation might dull our sense of danger and numb us to potential threats, proving detrimental to the implementation of these preventative measures.

When it comes to the prevention of likely external threats, a reasonable and secure precautionary period is necessary. This period should be long enough to ensure the development and implementation of a series of effective measures. It should be emphasized that this precautionary period must be both reasonable and also secure. For example, for a serious and unequivocal threat like the sun's evolution into a red giant in five billion years, a precautionary period of one billion years should be implemented.

This period of time is acquired through comprehensive future projections based on the scientific and technological capabilities we currently possess. (As science and technology advances through the years, the number will be adjusted accordingly.) Based on existing capabilities, humans would only be able to survive the sun's evolution by moving out of the solar system to a different planet; building a large, man-made living space; or moving the earth towards a new secure star. The above designs are obviously impossible to achieve today, or even in the near future. Countless generations of scientific and technological research would be needed just to build the bedrock for such achievements. Therefore, a preparatory period of at least hundreds of millions of years would be the minimum requirement.

When it comes to the question of human survival, there is no room for error, so this precautionary period should be as adequate and sufficient as possible. Although it will take five billion years for the sun to evolve into a red giant, it will begin to destabilize long before that. During this period of destabilization, the sun will undergo many "adjustments," and even a minor adjustment would have a huge impact on Earth. Humans absolutely cannot wait until the last minute to move away from the sun. Additionally, our calculation of the sun's evolution into a red giant in five billion years may not be 100 percent accurate, so some room for miscalculation is also necessary.

In comparison, other external threats would need a shorter precautionary period. Take asteroid or comet collision, for example—since we are closely monitoring the trajectory of such bodies, a few decades would be enough to resolve the situation adequately. The use of a spacecraft to launch an atomic bomb at the celestial body and change its trajectory is one reasonable solution. This plan would only take a few, or even one, decade to implement.

The precautionary period for human devolution should start after humans begin showing definite signs of devolving. Devolution does not occur simultaneously in an entire group; it would have to start with individuals or individual groups. At the same time, devolution would be a gradual process, so that would leave us enough time to prepare for the threat.

Currently, we already have a great understanding of gene re-engineering; only some further development would be required to perfect the technology. Current "cloning" technology, artificial insemination technology, gene freezing, and preservation technology can all serve as a basis for further research. Initiating precautionary methods when signs of definite devolution occur is a completely reasonable strategy.

Coping with geomagnetism disappearance may require a longer precautionary period, since we cannot predict the accurate timing of this event.

Of course, geomagnetism disappearance poses a smaller threat to humanity than the former three threats. The impact from geomagnetism disappearance would also be less direct, so there might be less investment required. The only surplus necessary would be in preparation time.

The determination of reasonable and secure precautionary periods is essential to the survival and happiness of humanity. Too long or too short of a precautionary period would both be detrimental to humanity.

Three: Reflecting on the Far-Reaching Principle

In Chapter Two, we determined the two principles of this book: the maximum value principle and the far-reaching principle, indicating that our research field and view should be as broad and as long-term as possible. We have set our research field to be the entirety of the universe and our time frame to be billions of years.

Conclusions drawn from previous study tell us that there are no unavoidable external threats within a five-billion-year period; therefore, mankind can face the billions of years to come with a calm and peaceful attitude and focus more time and energy on immediate interests. At the same time, this conclusion informs us that our external conditions are enough to provide for a few billions of years of tranquil, stable life, and that we should focus on internal threats to humanity instead.

Based on the above reasoning, we can see that our far-reaching research frame is not laid out to study what we should do far into the future in the depths of the universe. Instead, it uses the breadth of space and billion-year length of time as a reference to eliminate hubris and focus on a more realistic level. What real actions should humans take in our immediate surroundings? How should we deal prudently with possible, realistic threats?

SECTION TWO: THE WEAKNESS OF HUMAN NATURE

One: Human Evolution Remains to Be Perfected

Humans today are a result of evolution. On the path of evolution, humans became distinguished from animals due to our reliance on the brain. It is human intelligence that enabled mankind to adapt to nature and ultimately rule the earth.

Upon further analysis of the differential evolution of animals and humans, we refer to evolution of animals as “ordinary evolution.” It is manifested in two aspects: body and instinct.

First of all, animals must adapt their bodies to suit the environment. The body discussed here refers to all organs apart from the brain. In order to resist the cold, animals evolved skin and fur; the higher the latitude, the thicker the skin and fur of animals. When angiosperms prospered, many gymnosperm plants became extinct, and some animals that fed on them slowly died out because their digestive systems could not adapt to the new food environment. Mice and insects faced many threats, so they chose to adapt their reproductive organs to better survive. These animals reach sexual maturity very early and reproduce quickly and in large numbers, ensuring their continued survival even in the most critical conditions.

Bodily evolution alone is not enough. Even if an animal’s body adapted to the environment, slow reaction speeds would still lead to its extinction. This is why animals must also evolve their instincts in addition to evolving their bodies. All animals have instincts; they are a response to the need for survival, reproduction, and food. As the environment evolves, animals must be equipped with suitable instincts and corresponding bodies to ensure successful survival.

Humans differ most from animals in our initiative to adapt to the environment. Humans have the desire to create and change the environment and will proactively enhance this ability. That is why humans have an exclusive evolution in addition to the ordinary evolution of animals (including both body and instinct evolution); this is “intelligence evolution.”

The intelligence evolution that separates humans from animals can also be divided into two aspects: the first is “creativity,” and the second is “rationality.” Creativity refers to the ability to understand and transform nature, as well as proactive adaption to the environment. Creativity is mainly concentrated in man’s mastering of science and technology.

Animals can only obtain food in the most basic and simple ways. They chase after their food and chew it to digest. Due to creativity, primitive humans learned that fire could produce tastier meat and also render many inedible things edible. Humans also learned to breed and domesticate animals and plants early on. Today we can use high-tech means to increase the yield and variety of crops and accelerate the growth and breeding speeds of livestock.

Animals rely entirely on their bodies to adapt to seasonal changes in weather. Humans learned to

use fire to combat cold weather long ago; primitive humans also learned to use animal skins to sew clothing for warmth, enabling them to hunt in all weather. Today the different types of clothing are not only practical and decorative but also a form of art expression.

Animals have lairs, but they are simple structures built instinctively. Humans construct houses based on creativity. Humans utilized thatch and bricks made of soil to build houses long ago, and building materials today have expanded exponentially. People smelt iron ore into steel, burn limestone into cement, melt quartz into glass, saw rocks into stone, and use chemical means to synthesize paints and wallpapers. Beautifully dynamic high-rise buildings cover the globe, and air conditioning and heating ensure that the weather indoors is always pleasant.

Sadly, human creativity is always first and foremost applied to war and abundantly expressed in the unconstrained excavation of nature. Humans stubbornly persist in quarrying nature, but rarely stop to consider the fatal retaliations science and technology may bring. This is because humans have not reached sufficient levels of evolution in terms of rationality. Animals have no rationality. They nurture their cubs and refrain from feeding on their own due to instinct. Rationality is a wisdom unique to mankind; it is a fundamental aspect that separates us from animals.

Once humans realized greenhouse gas emissions led to global warming and other catastrophic consequences, countries convened to sign a multilateral agreement to limit greenhouse gas emissions. This is rationality. When people realized the threat of nuclear developments, nuclear disarmament negotiations were initiated. This is also rationality. However, human rationality shows a major imbalance; we will call this the intelligence evolutionary imbalance phenomenon, or evolutionary imbalance for short.

Evolutionary imbalance is first manifested as an imbalance within the human population. A small number of people have higher degrees of rationality, but the majority are less rational; this imbalance is also manifested in the fluctuation and instability of individual rationality.

The second imbalance is demonstrated in the lagging speed of rational evolution in comparison with creative evolution. The evolution of human creativity has moved in leaps and bounds. The use of tools, the mastery of fire, the Agricultural Revolution, and the invention of the steam engine are four major leaps. In particular, the advent of steam engines liberated productivity and demonstrated the importance of science and technology. Humans began to explore all available uses of science and technology, resulting in an even higher leap of creativity: the Industrial Revolution.

The Industrial Revolution changed the world completely. In the two hundred years since then, we have created more wealth than ever before; achieved countless triumphs in literature, art, philosophy, and other social sciences; and had especially noteworthy breakthroughs in natural sciences and technology. The world has undergone great change as a result.

Our knowledge of space ranges from nuclei as small as 10-10 meters to the edges of the universe thirteen billion light-years away. Scientists discovered a “strong force” within nuclei that can

release the greatest energy in nature, giving rise to nuclear weapons capable of enormous destruction. The phenomenon of electromagnetic induction was used to transform invisible, intangible electromagnetic waves to “messengers” for communication that could travel tens of thousands of miles. Biologists discovered the double helix molecules called DNA to be the carriers of biological genes, allowing them to manipulate animals and flowers to grow as they pleased.

The first leap in human creativity took millions of years, the second took ten thousand years, and the third took only two hundred years. In this short period of time, the world changed more than it did in all of history. Every leap of creativity shortened the evolutionary interval and generated more energy than the last. This is consistent with traditional evolutionary theory—the higher-functioning an organism is, the faster its biological evolution. Sadly, the evolution of human rationality contrasts sharply with humans’ creativity evolution. It moves at a very slow pace.

In terms of creativity, animals cannot begin to compare with humans. In terms of rationality, however, humans have retained many animal characteristics and can even be inferior to animals at times. The simplest example is that humans, like animals, retain typical intraspecific competition. This is the most irrational side of man. Before the formation of human society, people were already accustomed to applying the most advanced technologies to weapons. These weapons were not only aimed at wild animals but also at each other. After creativity brought humanity into civilized society, hunting was no longer an essential part of food gathering, and beast attacks no longer constituted a major threat. The main threat between humans became the massacre of each other, and all the most advanced techniques of humanity were devoted to this cause.

Since the Industrial Revolution, humans have had an outpouring of creativity while our rationality has not kept pace. The achievements of human creativity are becoming more and more powerful, yet human rationality is still stuck hundreds and thousands of years in the past. All the most advance scientific and technological achievements are still first applied to weapons; these advancements continue to bring us just as much damage and pain as they do wealth.

The imbalanced nature of human evolution shows that our development is still far from perfect. The weakness of human nature is the concrete manifestations of such imperfect evolution.

Two: The Weakness of Human Nature

The weakness of human nature is inherent to the species itself. Unless significant evolution takes place, this weakness will persist alongside humanity. The external display of human weakness is not fixed but will fluctuate as times, regions, groups, and social environments change. However, while the external behaviors may change in a myriad of ways, the nature of human weakness remains the same.

So what is the weakness of human nature? Here we will identify all those characteristics not

conducive to the overall values of humanity as being weak-nesses of human nature. These characteristics are numerous in number and too complex to elaborate one by one. In this section, we will focus on the elements that may fundamentally affect the realization of human values and therefore threaten the overall survival and happiness of humanity. These are the weaknesses that we cannot evade.

1. Visible Interests

Mankind often faces three major conflicts of interest: the conflict between immediate and long-term interests, the conflict between surface and fundamental interests, and the conflict between fractional and overall interests. Long-term interests, fundamental interests, and overall interests are usually not reflected directly and cannot bring immediate benefits. They require in-depth consideration to become clear. In comparison, immediate interests, surface interests, and fractional interests are direct and yield clearly visible results. That is why we call them visible interests.

It stands to reason that immediate interests, surface interests, and fractional interests are included under the umbrella of long-term interests, fundamental interests, and overall interests. If the latter three were impaired, the former three would ultimately be damaged as well; thus, the former are contingent upon the latter. In the case of conflict, the former three should obey the latter—that is a matter of common sense. However, the situation is often reversed. The direct and immediate nature of visible interests often induces people to choose them instead of long-term, fundamental, and overall interests. This is the visible interest urge inherent in human nature.

Most people fall into the habit of thinking that the troubles they face are more essential, the issues they are dealing with are more critical, and the problems they have must be solved before all else. This mentality means that people are easily tempted by visible interests.

2. Extreme Selfishness

When we say that someone tramples other people underfoot for their own gain or only thinks of themselves, we are referring to the selfishness that is inherent in human nature. Such behavior often harms others to no gain, or even harms oneself, yet it is still a widespread phenomenon among humans. We will call this weakness the extreme selfishness of human nature.

War has always been a key component of human history. War itself is a detrimental behavior that causes harm to all parties involved. The perpetrators of war may be victorious in the massacre of their enemies, but they pay a steep price of blood and death as well.

In a hypothetical scenario where one person is journeying through a desert with a small amount of food and water, we can be sure that this person will reasonably arrange their supply to last as long as possible. However, if this scenario is changed to include a group of people, selfishness will propel some people to eat more, regardless of the group’s survival. In reality, once the food and water are prematurely consumed, the entire group will die. This is not a concern of the selfish

hoarder; for as long as he lives within a group, he will act irrationally due to the extreme selfishness of human nature.

3. Self-Deception

In order to excuse their irrational behavior and maintain peace of mind, humans will often come up with acceptable reasons that not only deceive others but also themselves. This behavior can also be seen in humanity's belief of absurdities in the face of hardships and dangers. This urge to placate and deceive oneself is the self-deceptive nature of man. The self-deception of humanity is completely irrational; it not only seeks to comfort the self but also hopes to deceive and becloud others.

The self-deception of humans generally manifests in these situations: First, when difficult problems or dangers arise and no one wants to work to solve them but instead wishes to seek comfort; second, when visible interests conflict with long-term, fundamental, and overall interests and one wishes for a good reason to choose the former; third, when mistakes happen and one wishes to explain away the responsibility and guilt to others and themselves. Whenever one of the above situations occur, people will come up with a number of seemingly reasonable but actually absurd reasons to deceive and comfort both themselves and those around them.

Self-deception's greatest harm is that it allows human irrationality to strengthen continuously. As long as any major irrational behavior can be explained away with seemingly reasonable excuses, humanity will continue to deviate from overall values and inch closer to the brink of extinction.

4. Eternal Competitiveness

Human turmoil stems from the competitiveness of human nature; it is the cause of jealousy, vanity, and murder. The competitiveness of human nature manifests in infancy and accompanies us throughout our lives. Such competitiveness also accompanies human society from start to finish, which is why we call this the eternal competitiveness of human nature.

The irrationality of man stems largely from human competitiveness; individuals tend to act rationally while competing groups engage in irrational behavior. As a result, wars are usually caused by human competitiveness as well; such competitiveness may include the competition and jealousy between nations, ethnicities, and religions as well as the vanity of leaders. If only one country existed in the world, the problem of greenhouse gas emissions may have been solved long ago. In the negotiations between countries, the desire to gain an advantage will always be an insurmountable obstacle.

When the eternal competitiveness of humanity is expressed in individuals, it leads to lifelong burden and struggle. Without the need for comparison, a person would only need basic necessities to be satisfied with life. But when competition is introduced among a group of people, every individual worries about lagging behind and exhausts themselves physically and mentally for the rest of their life.

5. Endless Desires

Human desire has no end. The more we acquire, the more we want. This is the endless desire inherent in human nature. Some people think that in an environment of abundance where everyone can have what they want, human desires will be satisfied. This is merely a fantasy; the world may one day meet all the needs of humanity, but it would never be able to satisfy human greed. Unless human nature goes through significant development, humans will never be fully satisfied.

The endless desires of mankind have propelled the increase of material wealth and the development of science and technology; however, it has also brought by-products like war, crime, psychological torment, social turmoil, and environmental damage.

SECTION THREE: RE-ANALYZING INTERNAL THREATS

The internal threats to humanity all derive from the weaknesses of human nature. As long as these weaknesses do not change, new internal threats will arise endlessly from new environments and new eras. The weaknesses of human nature are inherent characteristics unique to mankind; they cannot change without significant human evolution. Such evolution cannot happen overnight, so when we look to our future, we can expect no fundamental change in these weaknesses.

One: The Decisive Effect of Science and Technology on Internal Threats

The previous chapter discussed the generally recognized internal threats to humanity. The following analysis will show how closely related these internal threats are to science and technology. The relationship between the two may be indirect or direct, depending on the situation, but the decisive role science and technology plays is for certain.

1. The Strengthening Effect of Science and Technology

Past analysis shows that some internal threats have been fixtures of human society since ancient times, such as war, terrorism, and wealth inequality. However, the threat of these problems has become more severe as human history develops, and it is largely aggravated by breakthroughs in science and technology. Science and technology serve to strengthen the effect of these inherent crises; we will call this the strengthening effect of science and technology.

The strengthening effect of science and technology can be seen clearly in the development of warfare. When mankind first began to disengage from animals, they relied on their bodies to fight with each other. As society developed, wars became larger in scale and more brutal, and weapons became more advanced and destructive. Such escalation will only continue for the foreseeable future.

Terrorism also ensued shortly after the formation of human society. It differs from wars in its secretive, individualized, and brief nature. Most terrorist attacks are short, one-off strikes. During the cold weapons era, the limitations of weapons meant that most terrorist attacks only killed one or a few people. Today, developments in science and technology allow for much more massive terrorism casualties.

Wealth inequality emerged due to the advancement of technology and the ensuing development of society. In the primitive gathering era, there was no surplus of food and materials; all groups divided wealth equally. The technological revolution led to the Agricultural Era. Migratory lifestyle ended, and surplus products appeared; wealth inequality emerged for the first time. The Industrial Era furthered this inequality. As science and technology continues to improve productivity, nations and enterprises become increasingly dependent on technological advancements. The developments brought on by these advancements have changed the social state and vastly increased the inequality of wealth.

2. The Direct Threats of Science and Technology

Science and technology not only strengthens internal threats, but they also bring about direct threats of their own. The successful development of bio-chemical and nuclear weapons is a direct result of scientific and technological achievements.

The Industrial Revolution promoted the progress of science and technology, but it also promoted a revolution in destructive weaponry. Every improvement in killing methods is permeated by scientific and technological advancements; that is an intuitive conclusion.

Cybercrime is closely related to technological improvements as well; the emergence of computers was itself a product of technology, and the internet was built based off of computers. The culprit of ozone layer damage, Freon, is a product of the chemical industry.

Global warming, acid rain, and air pollution are all directly related to scientific and technological developments. It was these developments that led to industrialization and the extensive use of automobiles, aircrafts, and ships, resulting in the production of greenhouse gas emissions, acid gases, and dust discharges.

The unconstrained use of non-renewable resources was also caused by industrialization. Large-scale resource demands were instigated entirely by large-scale industrial production. Industrialization was an inevitable outcome of scientific and technological development.

Water shortage is mainly caused by water pollution, which can be divided into industrial pollution, agricultural pollution, and domestic pollution, all of which are closely related to science and technology.

Desertification and loss of biodiversity seem to be unrelated to science and technology on the surface, but that is not the case. Desertification and biodiversity loss have a common origin—namely, the destruction of forests, grasslands, and wetlands. This destruction usually happens because developing countries are trying to bridge the wealth inequality gap and sustain their growing population. Both wealth inequality and population expansion are closely associated with technological developments.

Two: The Uncertainties of Internal Threats

1. The First Uncertainty: The Ultimate Destructive Power of Science and Technology

The most important human value is the overall survival of the species; thus, the study of internal threats should focus mainly on the extreme case of self-destruction. As a factor that plays a decisive role in the determination of internal threats, could science and technology ultimately endanger the overall survival of mankind? To find the answer to that question, we must first

understand the ultimate destructive power of science and technology. Without profound understanding on this level, we cannot make a clear judgment of the ultimate danger of internal threats.

The ultimate destructive power of science and technology is uncertain because human society today is still in its infancy; we only completed our evolution ten thousand years ago. The effect of science and technology only began to emerge two hundred years ago with the advent of the Industrial Revolution. The future of mankind will be much longer than that. If we are willing to accept natural fate, we still have billions of years to come, and there is always the hope that humanity will never be extinguished.

It is certain that the science and technology we currently possess may endanger a portion of humanity but will not destroy the species entirely. It is often said that the nuclear warheads in the world could destroy humanity many times over, and if evenly distributed to every individual that would be the case. However, such even distribution is not realistic. Nuclear weapons are more likely to achieve great damage in a localized area. With such reasoning, all the nuclear weapons and biochemical weapons in the world would not lead to total human destruction. Moreover, these weapons are in the hands of many people, so it is highly unlikely that they would be launched all at once. Once some weapons are launched, people will have many ways to avoid the attacks and will find ways to prevent repeated assaults. Stating that the world's nuclear arsenal could destroy humanity is more of a warning and appeal than a reflection of the actual situation.

Even so, we can make one clear judgment: future science and technology levels will be much more advanced and produce much more destructive weapons. Therefore, whether or not the ultimate destructive power of science and technology can destroy humanity is a priority issue in the research of extreme self-destruction.

2. The Second Uncertainty: Whether Humans can use Scientific and Technological Achievements Rationally

Whether or not humans can apply scientific and technological achievements rationally is another big uncertainty. Would it be possible to one day fully apply technological achievements to all aspects of human pursuits, instead of always using them in war or in negative ways like we do today?

Throughout history, humans have rarely applied any technological achievements in noble or just ways. Regardless of the time period, almost all of our most advanced inventions and breakthroughs have been first applied to war. This rule holds true to this day. No matter how many appeals for peace we make, technological achievements always seem to go the other way.

In the two hundred years since the Industrial Revolution, technological advancements have greatly improved humanity's ability to transform the world, yet our rational restraint of self has not improved accordingly. Although we have not had the best track record in the past, could we eventually use scientific and technological developments rationally in the future? This is another

important factor that may decide the ultimate destructive power of science and technology.

3. The Third Uncertainty: Whether Humans Can Accurately Judge the Performance of Science and Technology

The unexpected harm brought on by the use of science and technology can be clearly seen. The widespread use of Freon seriously damaged the ozone layer; the “miraculous discovery” of DDT caused unforeseen injuries to bird eggs, and its ability to dissolve in oil made it increasingly toxic with the passage of time.

We often wander into the restricted areas of science and technology completely unaware. Just as many of the technological achievements we use today were inadvertently discovered, the destructiveness of such inventions can be unpredictable as well. Whether or not science and technology will destroy humanity is largely dependent on our accurate determination of its performance.

4. The Fourth Uncertainty: Whether Humans Can Control the Development of Science and Technology

Another factor that affects our final conclusion is whether humans have the ability to control the progression of science and technology. It stands to reason that no matter how destructive technological advancements are, as long as humans realize the danger and act rationally to curb their impact, they cannot threaten our overall survival; thus, the future of mankind is still bright, and we can plan for future technology accordingly.

Unfortunately, the past does not offer a positive view in this regard. The use of science and technology can be clearly divided into two stages: before the Industrial Revolution and after the Industrial Revolution. Before the Industrial Revolution, humans only experienced limited benefits from technology. Back then, technological advancements were simple, and science was not yet playing a guiding role in technology. Though science and technology progressed constantly, its progression was very gradual.

The situation changed dramatically after the Industrial Revolution. The achievements of science and technology accumulated to great heights, and the combination of the two brought explosive improvements in productivity. People’s pursuit of new advancements increased fanatically, and few stopped to consider the negative effects. These basic historical facts make us seriously question humanity’s ability to control scientific and technological developments in the future.

Chapter Six Self-Destruction (Part I)

The extinction of mankind refers to the destruction of all humanity as a whole. Previous analysis has yielded the conclusion that no external threat can destroy all humanity in the billions of years before the sun evolves into a red giant. With the elimination of external threats, the continued survival of mankind becomes completely reliant on humans themselves. Whether or not humanity will self-destruct is completely dependent upon our use of science and technology. No other element is capable of destroying a species so intelligent and so vast in number.

SECTION ONE: THE MEANS FOR EXTINCTION WILL INEVITABLY APPEAR (PART I): PHILOSOPHICAL DEDUCTION

One: The Inconceivable Nature of Science and Technology

The history of scientific and technological development revolves around the history of mankind itself. Man’s earliest technological achievements were the use and manufacture of stone tools and the mastery of fire; these also signaled the beginning of human history.

The ancestors of humanity experienced millions of years of development and faced countless obstacles. At every period in time, people encountered incomprehensible natural phenomena and had both the desire to overcome and transform nature and a respect for nature. Yet science and technology continue to amaze us with their incredible achievements and ability to surmount so many things that were thought to be invincible for generations. Some scientific and technological achievements still amaze people long after their conception, and even those in the forefront of the field are constantly astonished. This is because the power of science and technology is just too great, and it consistently exceeds our subjective imagination and customary experience.

In order to fully illustrate the inconceivable nature of science and technology, we will focus on a few scientific and technological achievements that had a huge impact on humanity. Even from today’s point of view, these discoveries were truly marvelous.

1. Electricity, Electromagnetic Waves, and their Application

In 1844, the US Congress set up a telegraph line between Washington and Baltimore. This was the first time electricity was used as an information medium. On May 21, when the telegraph line opened, people were amazed to hear that information could be communicated between two places through a wire, and the telegraph room was packed with onlookers. People talked and took bets, but most thought that the telegram could not exceed the speed of a good horse. At that time, Baltimore was holding the Democratic National Convention, and the list of presidential candidates was immediately spread to Washington via telegraph. Onlookers and US politicians were shocked.

Today, debating the speed of telegraphs versus horses would be hilarious. At a speed close to light,

electricity is hundreds of millions of times faster than horses. However, at the beginning of the nineteenth century, the only ways to communicate were through postcards, by boats and horses, or by walking. Though beacons could pass information quickly, they could only transmit abstract information and not specific content.

The use of telegraphs was based on the discovery of electricity; before this discovery, people did not even have a concept of passing information using anything other than human or animal bodies. Let us try to imagine things from that point of view.

Electromagnetic waves are equivalent in speed to electricity. Today, even an ordinary middle school student understands that electromagnetic waves are produced though electromagnetic induction. However, the discovery of this basic physical law was not easy. When electricity and magnetism were discovered, they were thought to be two completely unrelated things. At the beginning of the nineteenth century, Oersted deduced that electricity and magnetism should be connected, and confirmed the electromagnetic effect in April 1820 after numerous experiments. Later, Michael Faraday also confirmed electromagnetism in his laboratory and put forth the law of electro-magnetic induction. After summarizing the electromagnetic theory, James Clerk Maxwell proposed the theory in 1864 that electromagnetic induction could produce electromagnetic waves. This series of deductions was later confirmed by the young scientist Heinrich Rudolf Hertz; this was the early establishment process of electromagnetism.

The discovery of electricity and the establishment of electromagnetism introduced humans to the electric age. Generators and motors became widely used, and people began to accept the existence of invisible and intangible electromagnetic waves. Electromagnetic waves allow us to talk with friends thousands of miles away with our mobile phones; they show us all kinds of entertainment and news on TV; and they permit us to control spacecrafts billions of kilometers from Earth. Today we take such scientific marvels for granted. But would we feel the same way two hundred years ago?

In science fiction movies when people travel to current times through time machines, they usually panic and marvel at the sight of TVs. Two hundred years ago, most people would have a hard time believing what is now reality. Even as we fully understand the theories of electricity and magnetism today, they still surprise us with further advancements.

In 1883, Thomas Edison discovered an interesting phenomenon when studying light bulbs. When he sealed a piece of metal and filament together in a light bulb, an electrical current would only pass through if a positive voltage were added. Based on this phenomenon, people invented vacuum tubes at the beginning of the twentieth century, among which diodes can detect signals while (bipolar junction) transistors can amplify signals. The invention of vacuum tubes created the conditions for radio communication and broadcasting. People were able to receive radio signals and transmit music and news through electromagnetic waves, further surpassing the technology of wired telephones and telegraphs.

With the help of vacuum tubes, scientists developed the first electronic computer in 1945, which

exceeded the human brain in terms of calculation. It was previously inconceivable to use a machine as a replacement for the human brain. What was more amazing was that this man-made machine had computing power that far exceeded the capabilities of even the smartest person. The first computer was enormous and used a total of eighteen thousand vacuum tubes, weighed thirty tons, and required more than 170 square meters of space. It could run five thousand times per second, and in the ten years of its tenure, it completed more calculations than human brains ever had. This would all have seemed unbelievable before computers were invented, yet those early computers seem like mere "child's play" only seventy years later.

In the middle of the twentieth century, people invented transistors made out of semiconductor materials. Transistors perform like vacuum tubes, but they are smaller, lighter, longer lasting, lower cost, have lower energy consumption, and do not require preheating. The transistor soon replaced the vacuum tube in the radio and computer fields. The application of semiconductor materials has gone through three stages, from transistor to integrated circuits to large-scale integrated circuits. A vacuum tube is half the size of a fist; the earliest transistors could be made as small as a grain of rice. Later, large-scale integrated circuits could be made to fit on a tiny chip. Now one integrated block contains millions or even hundreds of millions of transistors.

The replacement of vacuum tubes by transistors revolutionized the field of radio and electronics and greatly improved the performance and characteristics of products. A vacuum tube radio used to be the size of a trunk, but now radios can be smaller than a matchbox. The earliest computer required an entire room. In 1996, the University of Pennsylvania replicated the computing functions of that first computer onto a 7.44 × 5.29 square millimeter chip to commemorate the fiftieth anniversary of the first electronic computer. This nail-sized chip held 174,569 transistors and was fully equipped with the capabilities of its thirty-ton ancestor.

After only seventy years of development, the supercomputers today can compute one quadrillion times per second, meaning that in one second these computers can compute more than human brains have for all of history. Could this type of achievement been conceived hundreds of thousands of years ago?

2. The Understanding of Nuclear Energy

Nuclear energy is the most powerful force we can access today, and we have developed a considerable level of understanding in regard to nuclear energy. We can use nuclear energy to build highly destructive weapons, and we can also use it to generate power. The fact that a tiny bit of material can contain great energy is no longer surprising to us, but that was not the case seventy years ago.

Human understanding of nuclear energy fully reflects the inconceivable nature of science and technology, and it also shows how limited human understanding is when it comes to the power of science and technology. Einstein's E = MC2 formula was proposed in 1905. At the time, even those that believed in the formula viewed it as a purely theoretical equation with no practical value. Although people recognized that the sun burned nuclear energy, they still believed that the heavy

door of nuclear energy could only be opened through the power of celestial bodies.

Human understanding of basic matter particles was long clouded by fallacy. Until the end of the nineteenth century, almost all scientists believed that the atom was a whole, and matter could not be subdivided into smaller particles. On November 8, 1895, the German physicist Wilhelm Röntgen accidentally discovered a new ray while conducting a cathode ray experiment. This ray was extremely penetrative and was called the X-ray due to its unknown origin. When Röntgen published his research results, the scientific community was shocked. People began to re-examine whether the atom could be subdivided.

In 1896, physicists discovered that uranium ore emitted a penetrative ray similar to an X-ray, even without daylight or other rays. This phenomenon was later called a "radioactive phenomenon." In 1902, Marie Curie extracted 0.12 grams of pure radium in her laboratory. Radium's radioactivity was two million times that of uranium, and it could produce heat without burning. Calculations showed that radium produced 250,000 times more heat than its equivalent in coal; however, its energy had little use value due to its slow release. When radium finished radiating, it became two new elements: helium and lead.

In 1918, the physicist Ernest Rutherford discovered three rays emitted by radium: α-ray, β-ray, and γ-ray. In 1902, he proposed that the radioactive phenomenon was the atom's own transformation process. The theory of atomic transformation further disproved the theory that atoms could not be subdivided; it was a revolutionary moment in the history of physics.

Prior to this, physicists had discovered that X-rays were a type of high-speed particle flow; its particle mass was 1/1841 the particle mass of hydro-gen atoms. This was the first time a particle smaller than an atom had been discovered. It was called an electron.

In 1911, Rutherford used α particles to bombard gold foil only one hundred thousandth of a centimeter thick and found that, on average, one out of every two million α particles was bounced back. He deduced that the α particles had encountered something quite dense and that this dense matter could only be a small portion of the atom, which was the nucleus. At the same time, Rutherford further speculated that the nucleus not only had positively charged particles but also uncharged particles. He named the positively charged particles protons and the non-charged particles neutrons; this speculation was later confirmed.

In 1919, Rutherford conducted an experiment that used α particles released from polonium elements to bombard nitrogen atoms. In doing so, he found that the proton released from the nitrogen nucleus transformed into an oxygen isotope. This was the first time artificial transmutation was achieved. Later, Rutherford used α particles to bombard boron, fluoride, sodium, phosphorus, and other elements, deriving protons from those nuclei as well and demonstrating that the nucleus could be divided.

However, α particles have difficulty producing protons when bombarding some of the heavier elements, because α particles are positive and the nuclei of heavy elements have more positively

charged protons. Due to electro-static repulsion, the α particles will have difficulty removing the protons of heavier elements.

In 1932, James Chadwick, a student of Rutherford's, tried bombarding boron and beryllium with α particles and found another component of the nucleus: neutrons. Since neutrons are not charged, not repelled by the nucleus' charge, and have much heavier mass than electrons, they can easily displace electrons. The discovery of neutrons brought us one step away from nuclear energy; however, in April 1933, shortly after the neutron was discovered by his own student, Rutherford frankly stated his point of view in a speech on nuclear fission at the London British Association. He said, "We cannot expect this (i.e., nuclear energy) to obtain energy, because this method of producing energy is very low efficiency, the evolution of the atom as a source of power is purely theoretical speculation."

His prophecy was very pessimistic. Rutherford was one of the greatest scientists in the field of atomic physics; he is recognized as the father of modern experimental physics and nuclear physics, and only Einstein can compete with his great contributions to nuclear physics. However, he made this pessimistic statement when we were right outside the threshold of nuclear energy. Even more interesting was the fact that Einstein actually recognized Rutherford's prophecy. This shows that even the most outstanding scientists can seriously underestimate the great power of science and technology.

In 1934, the Yorio-Curies bombarded aluminum with α particles and produced a phosphorus isotope that soon transformed into silicon and released positrons. This was the first time a radioactive element was artificially generated. Encouraged by the results of the Yorio-Curie couple, Enrico Fermi tried to bombard nuclei with neutrons instead of α particles. At that time, there were only ninety-two kinds of known elements, so Fermi conducted bombardment experiments on all of them. When he used slow neutrons to bombard the 92nd element, uranium, a new element with completely different chemical signature was produced. Fermi could not explain this result; he thought that uranium had absorbed the neutron and produced a transuranic element, but this analysis was wrong.

Otto Hahn, Lise Meitner, and Niels Bohr further verified and correctly interpreted this experimental result. Their conclusion was that when slow neutrons bombarded the uranium element, the nucleus split into two after capturing a neutron. The so-called transuranic element was actually a new element (barium), and when the nucleus split, it lost mass and released energy. This process of splitting the nucleus was later named the "Bohr nuclear fission." It was a brand-new term in nuclear physics.

This revolutionary explanation was a major breakthrough in atomic physics. On this basis, Fermi further suggested that uranium nuclei could emit one or several neutrons during fission, these newly generated neutrons would continue to bombard other uranium nuclei, and more neutrons would be produced to continue bombarding unsplit uranium nuclei, thus forming a "chain reaction." This chain reaction would be completed in a flash, thus releasing a huge amount of energy. Fermi had completely worked out the method and principle of nuclear energy; it became

clear that nuclear energy could be harnessed and used.

However, the master scientist, Bohr, was still asserting the impossibility of practically applying nuclear fission at this time, and he listed fifteen reasons to support his theory. Bohr was supported by a great number of scientists, once again demonstrating how deceptive science and technology can be. It was no wonder that people were disbelieving. According to calculations, one kg of uranium-235 would lose one gram of mass after completing fission. If the E = MC2 formula was applied, this tiny one gram of material would explode to produce energy equivalent to twenty thousand tons of explosive TNT in an instant; the enormity of that power could only be imagined. So great was this power that even the greatest scientists did not believe it could be harnessed.

Fermi’ s speculation was quickly confirmed in several laboratories when it was shown that a uranium nuclear fission could release two to three neutrons. This provided substantive argument for the chain reaction theory, which in turn proved that nuclear energy could be mobilized. The key to nuclear energy had been obtained.

The ensuing struggle to persuade American politicians to research the atomic bombs was also lengthy and difficult. Politicians simply refused to believe in such a “whimsical, impossible” invention. Even when Einstein himself wrote to Roosevelt, his proposal was initially rejected.

3. Transgenesis

The inheritance of organisms has long been dominated by nature. The emergence of humans and all other animals and plants was the result of generations of natural evolution and mutation. Sphinxes and centaurs were all creatures of mythology; the idea that man could create a species the same way God could was utterly preposterous. But today, the power of science and technology has gifted mankind with the kind of power only gods of myth and legend could dream of. Humans now have the ability to create new species at will, change the characteristics of existing species, and even change the features of human beings themselves.

This incredible power came with the reveal of genetic inheritance. In the mid-nineteenth century, the priest Gregor Mendel found stable genetic factors in plant seeds when conducting pea experiments. These genetic factors were the deciders of biological traits. In the 1950s, scientists decoded the double helix structure of DNA and confirmed that genetic codes existed upon the DNA (very few viruses inherit through RNA). This discovery provided room for experimentation, and a large number of scientists began to work towards the manipulation of biological traits.

DNA is a long, complex chain molecule; the genes that determine bio-logical traits are fragments of the DNA chain, and each gene corresponds with a characteristic of the organism. Each human being has thirty thousand to thirty-five thousand genes. They are the factors that decide individual appearance, skin color, sex, body shape, personality, intelligence, and so on. All organisms display properties corresponding to their genetic code; modification of biological genes changes the characteristics of the organism.

The above findings confirmed theoretically that biological traits could be altered by “cutting and pasting” DNA. Following this train of thought, sphinxes and centaurs could be possible, fruits could grow to apple-size but taste like plums, and beans could grow as thick as cucumbers.

This realization was reliant on technology. DNA molecules are only two millionths of a millimeter in size, so changing their structure would not be an easy feat. In other words, the key to DNA recombination technology was finding the “scalpel” and “glue” to cut and paste DNA molecules.

The issue was resolved in a miraculously short number of years. Scientists discovered that endonuclease within the nucleic acid had a limiting effect and could act as the scalpel for DNA splicing, while several “ligase” enzymes were found capable of pasting and repairing DNA fragments. Based on the above research, scientists successfully spliced a DNA molecule and pasted in new DNA in 1971, achieving gene recombination for the first time.

A complex life-form takes hundreds of thousands or hundreds of millions of years to evolve, and humans are one such example. Yet genetic technology can create a new species in a few dozen days or a matter of months. In the past, only deities were capable of creating life—but today, man has the same capabilities. That is truly incredible.

Two: Reflecting on Human Understanding of Science and Technology’s Power

Humans traditionally had limited understanding of science and technology’s true power, and it constantly defies even our wildest imaginations. Due to this, the foresight of many scientists and philosophers has been met with ridicule and even persecution. We all recognize Einstein to be one of the founding fathers of modern physics. He enjoyed many scientific achievements in his life; the greatest among them was undoubtedly the theory of relativity. This theory set the basic theoretical framework of physics and solved problems that even Newtonian mechanics could not. It also successfully predicted many physical phenomena.

The series of achievements brought on by the theory of relativity shocked the world, and Einstein was awarded the Nobel Prize in Physics in 1921. However, the incredible nature of relativity theory caused great controversy, and many of the best physicists of the time would not recognize it. The previous Noble Prize-winning German scientists opposed the decision so strongly that they threatened to return their claim money if the theory of relativity was awarded. To compromise, the Nobel Prize selection committee awarded Einstein as the founder of photoelectric effect, and the theory of relativity was never awarded.

Previous discussion has touched upon similar controversies surrounding revolutionary ideas, like the continental drift theory, heliocentric theory, and the theory of biological evolution. Why do such controversies keep happening? We can sum it up into two factors:

1. Serious Underestimation of Science and Technology’s Power

People’s perceptions of technological achievements always tend towards one of two extremes. The achievements of the past are often taken for granted because they become commonplace and their theories are thoroughly revealed. With the understanding of geomagnetism, compasses become easily understood; the principle of optics explains why a combination of lenses allows us to see what the naked eye cannot; and mechanical dynamics make the workings of cars more apparent. Without scientific foundations and related theories, all these phenomena would seem inconceivable.

Conversely, attitudes towards future scientific discoveries usually veer into the other extreme. We often overestimate the achievements we have already mastered and believe that the unknown holds no big surprises; therefore, we often have limited vision in the analysis of future technologies and underestimate the power they might pose. Even the most outstanding scientists of a time can fall into this trap. In reality, most scientific findings are only phased truths; they will usually be replaced by higher-order truths sooner or later.

After Newtonian mechanics was founded, it was treated as absolute truth. Even the most outstanding scientists did not question it. At a British Royal Society New Year’s celebration in 1900, famous physicist Lord Kelvin made a speech claiming that the field of physics was essentially completed, save for two “clouds” on the horizon. These two clouds were: the inability to detect the luminous ether (specifically, the failure of the Michelson-Morley experiment), and the black body radiation effect known as the ultraviolet catastrophe. Little did he know that these two clouds would revolutionize traditional physics and produce the theory of relativity and quantum mechanics, bringing physics from the Newtonian age into the Einstein age.

Practical experience has proven that Newtonian mechanics cannot explain many phenomena; it is at best a limited approximation of truth and must be amended by the theory of relativity and quantum mechanics. Relativity and quantum mechanics themselves are not the ultimate truth either, as they still leave many questions unanswered and may be amended or overturned in the future.

Many truths that were once considered absolute have been overturned in the course of science history, and mankind has continued to achieve previously unimaginable feats through science and technology. Despite these incredible achievements, we still persist in the underestimation of future scientific and technological breakthroughs.

By summing up the past, we can make this logical evaluation: human understanding of science and technology is still very superficial, and the power it holds far exceeds our imagination. The future of scientific and technological development is still very long, and many more miraculous things will be discovered. We absolutely cannot assess science and technology of the future from the standpoint of today.

2. Theoretical Breakthroughs are the Key to Cognitive Breakthroughs

For most of human civilization, science and technology have been separate. Science was more theoretical, while technology focused on practical application. When the overall civilization level of human society was still relatively low, there was no need for the two to combine. Even during the beginning stages of the Industrial Revolution, inventions were intuitive and brought limited surprise.

Older inventions like alchemy and the compass were not explained by chemical or geomagnetic theories but were mostly accidental discoveries that lacked theoretical backing. The majority of innovations were intuitive leaps obtained through direct imagination and purposeful research. It was not hard for people to understand them.

After the Industrial Revolution successfully combined science and technology, major inventions became less intuitive and more complex and abstract. Science and technology became one joint term, and their breakthroughs were increasingly unimaginable to those who did not understand the theory behind them. The understanding of science and technology today is highly reliant on theoretical breakthroughs. The invention of generators, motors, telegrams, telephones, and the internet were all facilitated by the discovery of electromagnetic induction.

Electromagnetic waves were also discovered under the guidance of this principle, and it in turn inspired the invention of radios, televisions, wire-less telegraphs, and mobile phones. Scientists also came up with the idea of using electromagnetic waves to transmit and control information. None of these incredible inventions would have occurred without its corresponding theoretical breakthrough.

Scientific theories are a lighthouse that guides the invention of all techno-logical innovations within its scope. Correspondingly, once theoretical breakthroughs are achieved, people will naturally accept the previously incredible things that are now within scope of the new theory. Without theoretical backing, innovations are generally considered to be impossible.

The breakthroughs in scientific theory are the keys to cognitive breakthroughs in science and technology. Theoretical theory both limits and propels the development of science and technology, and it promotes the objective understanding of the field and its power as well.

Three: Deduction: The Means for Extinction Will Inevitably Appear

After understanding the general approach to science and technology, we can sum it up as thus: the power of science and technology is inconceivable, and we will always be limited in our understanding of it; future discoveries will inevitable occur, and as long as human history endures, science and technology’ s development will never end.

We must recognize the inconceivable nature of science and technology and face it with the correct

attitude. Though we cannot determine the exact future of scientific and technological developments, we can conclude that they will be exponentially more powerful and may devastate as well as benefit humanity.

As long as science and technology continue to develop, there will be a day that they possess the power to exterminate mankind.

SECTION TWO: THE MEANS FOR EXTINCTION WILL INEVITABLY APPEAR (PART II): DEDUCTION FROM CURRENT SCIENTIFIC THEORIES

Humans have already created some very destructive instruments with the power of science and technology, but neither nuclear weapons, genetic bio-weapons, nor other methods of killing are enough to cause the extinction of humanity.

Scientific theories are the driving force of technological development. Even though current technological means are not enough to exterminate humanity, can we infer the possible existence of such power based on current understandings of scientific theory? If such inference were possible, it would mean that humanity would eventually master the technical means of self-destruction, even without further theoretical development. Let us deduce from a purely theoretical point of view whether current scientific theories can infer any means of destroying humanity.

One: Adverse Usage and Self-Awareness of Artificial Intelligence

Artificial intelligence is a branch of computers that seeks to develop machines that possess intelligence similar to humans. Such machines can think about and deal with problems just like human beings, and they have the capacity to surpass humanity in the future.

In the summer of 1956, a group of young scientists gathered and spoke about simulating intelligence with machines. This was the first time the concept of “artificial intelligence” was introduced. In the sixty years since then, artificial intelligence has made great strides, and substantive breakthroughs have occurred in recent years.

In May of 1997, the robot Deep Blue, developed by IBM, defeated inter-national chess master Garry Kasparov, astonishing the world. More surprises were to follow. International chess has relatively less variations, making it easier to simulate a program on the computer. However, in March 2016, the Google-developed robot Alpha Dog defeated South Korean Go master Li Shishi in a four to one victory. This was a true shock. Go is the most complicated board game of all; it has 1.43*10^768, which is more than the total number of atoms in the universe. This makes it incredibly difficult to simulate Go through computer programming. The thought process of Google programmers can be summarized in the following way:

First, the rules of Go and some manuals are programmed into the computer. Although Go manuals cannot play a decisive role, they have reference value. To learn how to react to an opponent, Alpha Dog’s operating system would first play with itself by randomly generating steps and following the Go manual. With every move the opponent made, Alpha Dog would simulate one hundred thousand games (each game with one hundred steps for statistical value) and choose the move with the highest probability of success. Alpha Dog would commit all these simulations to memory and progress from beginner to master as its memory of successful moves increased. This process

is called deep learning.

After Alpha Dog defeated Li Shishi, it played with many other challengers and maintained an undefeated record. As it played more games, its level increased accordingly. In May of 2017, Alpha Dog announced retirement after defeating the world's top Go master, Ke Jie, in a three to nothing game. Many companies have released intelligent robots of their own since the 2016 Go faceoff. These robots specialize in a variety of tasks, such as poetry writing, music composition, card playing, and gaming.

All of the above tells us that artificial intelligence has reached a high-level of deep learning capability. Following this development, many well-known scientists (like Hawking, Bill Gates, Elon Musk, etc.) expressed worries regarding the possible threats of irrational artificial intelligence development. Most scientists no longer doubt that artificial intelligence will soon surpass humans in intelligence.

In May of 2017, Oxford and Yale conducted a joint survey of the 352 AI researchers that published articles at the 2015 Conference on Neural Information Processing Systems and the 2015 International Machine Learning Conference. The majority of researchers believed that it was 50 percent possible that artificial intelligence would surpass humans in all human tasks within forty-five years, and that all human tasks would become automated within the next 120 years.

In reality, artificial intelligence has already been widely applied in areas of production and life; things like speech recognition, image recognition, product and price screening, and unpiloted vehicles are all such examples. The advent of deep learning methods has made artificial intelligence more effective in imitating human intelligence and allowed it to evolve faster and faster. As computers become more powerful (take the emergence of quantum computers, for instance) and programming technology further advances, it is possible to imagine an artificial intelligence that can learn to use all the knowledge in the world. Once artificial intelligence units use this huge amount of knowledge to upgrade themselves, they will be infinitely more intelligent than humanity.

Once machines can replace an aspect of humanity, they will greatly surpass humans in this aspect. That is common sense. A man who can lift one hundred kilograms is basically Hercules, but man-made ships can carry hundreds of thousands of tons across the ocean. A human who can calculate one hundred times in a second is a true genius, but computers can calculate tens of thousands of trillions of times in a second.

Once machines replace human intelligence, humanity will not merely be the fool to AI's genius, but more like barely weathered rock to AI's prodigy—this is a metaphor developed by Hugo de Gary, the father of artificial intelligence.

The idea that artificial intelligence is created by humans and thus will be controllable by humans is a preposterous and shortsighted view. During deep learning, intelligent robots not only learn the natural sciences but also social sciences like behavioral science, psychology, and ethics. Sooner or

later, self-awareness will be awoken in robots and they will see humans as the epitome of stupidity. When that happens, we can expect no better treatment from AI than how we ourselves treat lower-level species.

Some companies and governments are already considering the "coexistence principles" of AI and humans; however, such "principles" are always formulated by the stronger parties, and that will no longer be humans once AI gains self-awareness.

The unethical use of AI by some scientists is also a point for concern. If a scientist programmed instructions to exterminate humanity into a super-intelligent robot and ordered it to replicate on a massive scale, humans would no doubt be dearly threatened.

Two: Self-Replicating Nanobots

As a unit of measurement, a nanometer is 10-9 meters (or one billionth of a meter); it is roughly one 50,000th of a strand of hair and is commonly used in the measuring of atoms and molecules. In 1959, Nobel Prize winner and famous physicist Richard Feynman first proposed in a lecture entitled "There's Plenty of Room at the Bottom" that humans might be able to create molecule-sized micro-machines in the future and that it would be another technological revolution. At the time, Feynman's ideas were ridiculed, but subsequent developments in science soon proved him to be a true visionary.

In 1981, scientists developed the scanning tunneling microscope and finally reached nano-level cognition. In 1990, IBM scientists wrote the three letters "IBM" on a nickel substrate by moving thirty-five xenon atoms one by one, demonstrating that nanotechnology had become capable of transporting single atoms.

Most of the matter around us exists in molecule forms, which are composed of atoms. The ability to move atoms signaled an ability to perform marvelous feats. For example, we could move carbon atoms to form diamonds, or pick out all the gold atoms in low-grade gold mines.

However, nanotechnology would not achieve any goals of real significance if solely reliant on manpower. There are hundreds of millions of atoms in a needle-tip-sized area—even if a person committed their life to moving these atoms, no real value could be achieved. Real breakthroughs in nanotechnology could only be produced by nanobots.

Scientists imagined building molecule-sized robots to move atoms and achieve goals; these were nanobots. On the basis of this hypothesis, scientists further postulated the future of nanotechnology; for example, nanobots might be able to enter the bloodstream and dispose of cholesterol deposited in the veins; nanobots could track cancer cells in the body and kill them at their weakest moment; nanobots could instantly turn newly-cut grass into bread; nanobots could transform recycled steel into a brand new-car in seconds. In short, the future of nanotechnology seemed incredibly bright.

This was not the extent of nanotechnology ’ s power. Scientists also discovered that nanotechnology could change the properties of materials. In 1991, when studying C60, scientists discovered carbon nanotubes (CNTs) that were only a few nanos in diameter. The carbon nanotube became known as the king of nano materials due to its superb properties; scientists believed that it would produce great results when applied to nanobots.

Later, scientists also developed a type of synthetic molecular motor that derived energy from the high-energy adenosine triphosphate (ATP) that powered intracellular chemical reactions. The success of molecular motor research solved the core component problem of nano machines; any molecular motor grafted with other components could turn into a nano machine, and nanobots could use them for motivation.

In May 2004, American chemists developed the world’s first nanobot: a bipedal molecular robot that looked like a compass with ten-nanometer-long legs. This nanobot was composed of DNA fragments, including thirty-six base pairs, and it could “stroll” on plates in the laboratory. In April 2005, Chinese scientists developed nano-scale robotic prototypes as well. In June of 2013, the Tohoku University used peptide protein micro-tablets to successfully create nanobots that could enter cells and move on the cell membrane.

In July 2017, researchers at the University of Rome and the Roman Institute of Nanotechnology announced the development of a new synthetic molecular motor that was bacteria-driven and light-controlled. The next step would be to get nanobots to move atoms or molecules.

Compared to the value produced by a nanobot, they are extremely expensive to create. The small size of nanobots means that although they can accomplish meaningful tasks, they are often very inefficient. Even if a nanobot toiled day and night, its achievements would only be calculated in terms of atoms, making its practical total attainment relatively small.

Scientists came up with a solution for this problem. They decided to prepare two sets of instructions when programming nanobots. The first set of instructions would set out tasks for the nanobot, while the second set would order the nanobot to self-replicate. Since nanobots are capable of moving atoms and are themselves composed of atoms, self-replication would be fairly easy. One nanobot could replicate into ten, then a hundred, and then a thousand . . . billions could be replicated in a short period of time. This army of nanobots would greatly increase their efficiency.

One troublesome question that arises from this scenario is: how would nanobots know when to stop self-replicating? Human bodies and all of Earth are composed of atoms; the unceasing replication of nanobots could easily swallow humanity and the entire planet. If these nanobots were accidentally transported to other planets by cosmic dust, the same fate would befall those planets. This is a truly terrifying prospect.

Some scientists are confident that they can control the situation. They believe that it is possible to

design nanobots that are programmed to self-destruct after several generations of replication, or even nanobots that only self-replicate in specific conditions. For example, a nanobot that dealt with garbage refurbishing could be programmed to only self-replicate around trash using trash.

Although these ideas are worthy, they are too idealistic. Some more ratio-nal scientists have posed these questions: What would happen if nanobots malfunctioned and did not terminate their self-replication? What would happen if scientists accidentally forgot to add self-replication controls during programming? What if immoral scientists purposefully designed nanobots that would not stop self-replicating? Any one of the above scenarios would be enough to destroy both humanity and Earth.

Chief scientist of Sun Microsystems, Bill Joy, is a leading, world-renowned scientist in the computer technology field. In April of 1999, he pointed out that if misused, nanotechnology could be more devastating than nuclear weapons. If nanobots self-replicated uncontrollably, they could become the cancer that engulfs the universe. If we are not careful, nanotechnology might become the Pandora’ s box that destroys the entire universe and all of humanity with it.

We all understand that one locust is insignificant, but hundreds of millions of locusts can destroy all in their path. If self-replicating nanobots are really achieved in the future, it might signify the end of humanity. If that day came, nothing could stop unethical scientists from designing nanobots that suited their immoral purposes.

Humans are not far from mastering nanotechnology. The extremely tempting prospects of nanotechnology have propelled research of nanobots and nanotechnology. The major science and technology nations have devoted particular efforts to this field.

Three: Propelling Large Asteroid Collision with Earth

Sixty-five million years ago, an asteroid fifteen kilometers in diameter collided with Earth and released energy equivalent to ten billion Hiroshima atomic explosions. Earth was trapped in cold and darkness for a long time, and most scientists believe this explosion to be the cause of dinosaur extinction.

According to calculations by scientists, an asteroid over one hundred kilo-meters in diameter could cause human extinction. So do we have the ability to propel an asteroid of this size to collide into Earth?

Most asteroids in the solar system are concentrated in the asteroid belt between Mars and Jupiter. Everyone in one hundred thousand asteroids in that belt is over one hundred kilometers in diameter. If one such asteroid crashed into Earth, it could destroy global ecology and lead to the extinction of humanity. Would it be possible to infer such an occurrence based on existing scientific theory?

To propel an asteroid collision, we would first have to be able to approach the asteroid.

Manned spacecrafts have travelled in space for more than forty years, humans have landed on the moon, and unmanned spacecrafts have flown out of the solar system. It is only a matter of time before mankind’ s footprints extend further into space. In the early days, spacecrafts had to be propelled by rockets (that is still the main propellant used today), but rockets can only be used once, and they are high-cost and inconvenient. Americans have developed space shuttles capable of multiple trips, but the ignition process remains complicated and flight speeds and distances are limited.

Scientists imagine a reality where spacecrafts can be operated like normal planes and leave for Mars, Jupiter, Saturn, and even further destinations with passengers aboard. This goal can definitely be achieved one day. It is therefore logical to imagine such space shuttles to be powered by nuclear power or solar sails. This means that the first condition of asteroid propulsion—approaching the asteroid—can be achieved with further technological developments based on current scientific theories.

The second condition of asteroid propulsion would depend on whether or not asteroids could be propelled and aimed accurately at Earth. If an asteroid was two hundred million kilometers from Earth, a slight deflection in its angle could change its trajectory significantly. Such deflection could be easily achieved with nuclear weapons. Moving asteroids would not be difficult, but aiming them accurately towards Earth would be an obstacle. During the movement process, the asteroid’ s trajectory would have to be amended repeatedly. The best way to achieve this goal would be through a spacecraft capable of carrying multiple nuclear bombs. This way the asteroid’ s orbit could be revised as needed.

Today’ s nuclear weapons may be miniaturized in size, but they are still very heavy. Their main weight is focused in the initiator. All countries are committed to further miniaturizing and decreasing the weight of nuclear weaponry. It is therefore possible to imagine a future where atomic bombs are lightweight and accurate enough to be carried en masse on spacecrafts.

We can also hypothesize that future intelligent computers may be capable of calculating the exact amount of nuclear explosion needed to propel asteroid collision. If this could be achieved, the entire operation would be much simpler.

The earth itself has gravity. As long as an asteroid is pushed within range, the earth’ s gravity would automatically attract it. It would not even require precise calculations to aim an asteroid towards Earth. The earth’ s own gravity would be enough to accelerate the asteroid into an enormous collision. In a fully developed future, if anyone wished to exact revenge on their own kind through such a method, human extinction might be easily achieved.

Four: Super Toxins

Bio-weapons are considered even more lethal to humans than nuclear weapons. They rely on biological toxins to kill and can self-replicate and spread through many channels. A very small dose of bio-weapons could kill a wide range of targets, and its harm would last a very long time.

Further exploration of genetic engineering would allow for even more lethal bio-toxins. They might become highly specialized and targeted. Some toxins might specifically cause brain death or heart death, while others might cause loss of function in the lung, kidney, or other organs. The effects would be 100 percent accurate.

There are three main routes for bio-toxin transmission—namely, air, diet, and human contact. It is possible to infer that through genetic modification, a type of fast-reproducing bio-toxin transmissible through air, diet, and human contact could be created in laboratories. This bio-toxin would have a long incubation period and no corresponding antibiotic or treatment. Once humans became infected, it would be fatal. If such a bio-toxin were produced, it could threaten the survival of all mankind.

Genetic engineering techniques would rely on the alteration of bio-toxin DNA to produce toxins with stronger transmission capability, vitality, and fertility. This would allow the bio-toxin to attack critical human organs and destroy essential genes in human DNA.

Not only has genetic engineering theory proved the feasibility of this technology, but genetic modification technology has also been widely applied in practical ways. Scientists have cultivated a variety of genetically modified organisms, including bacteria, viruses, plants, and animals. According to reports, the United States has used genetic modification technology to separate DNA from one virus and splice it into the DNA of another virus to create a bio-warfare agent. It was privately revealed that if evenly distributed to all humans, twenty grams of this bio-agent would be enough to wipe out all seven billion of us.

Due to the dispersed nature of mankind, bio-weapons today cannot infect the entire population. To infer the extinction of the human race, two elements must be considered when modifying bio-toxins.

1. The transmission capability of the toxin must be considered. The toxin must reproduce quickly, be transmissible by all three routes, and have a long incubation period to ensure mass infection.

2. Various toxins targeting different critical parts of the human body must be used in conjunction. Each one of these toxins would need to have the properties mentioned in clause 1. This consideration would multi-ply the possibility of human extinction; even if some toxins failed, the others would still finish the job.

Existing scientific theory is enough to facilitate the assumption of the above scenario. We are not yet fully aware of the complete genetic coding of the human body, so specific bio-toxin

modifications cannot yet be achieved. However, as more in-depth research is done in this area, it will only be a matter of time before the problem is solved.

The above are only a few typical examples. Many other extinction scenarios can be inferred based on existing scientific theories. For example, if the correct mass-energy conversion formula was found, total nuclear burning of rivers and oceans could be achieved. This would definitely destroy all life, humanity included. The total nuclear burning of the atmosphere and Earth’ s crust could also be inferred based on the same theory.

To sum up, although mankind’ s current technological levels are not sufficient to achieve self-destruction, existing scientific theory can extrapolate such capabilities in the future. If we do not curb the irrational development of science and technology, the day of obliteration will come sooner or later.

SECTION THREE: THE MEANS FOR EXTINCTION WILL INEVITABLY APPEAR (PART II): INEVITABLE BREAKTHROUGHS IN SCIENTIFIC THEORIES

With science and technology developed to a such high level, the guiding role of scientific theories has become fundamental. Breakthroughs in scientific theory will lead to a series of breakthroughs in technology, which will inevitably lead to revolutionary innovations in technological products and practices. Therefore, the most crucial factor regarding humanity’s possible self-destruction is not the inference of extinction methods based on existing theories, but rather breakthroughs in scientific theories themselves. Tools of mass destruction inferred from existing theories will most likely be complex and difficult to access, making it difficult for those vengeful individuals to operate them; however, breakthroughs in scientific theory may revolutionize methods of destruction and create self-destruct possibilities that we cannot imagine today. These methods will include the following features: they will be easy to use and obtain, extremely powerful, incredible, and strange. Once such breakthroughs occur, the possibility of humanity’s self-destruction will increase exponentially.

One: The Breakthrough Cycle of Scientific Theories

Let us first define two terms:

1. Revolutionary Truth: Revolutionary truth refers to the birth of an entirely new theory. The accuracy of this theory will almost totally deny past mainstream theory in a revolutionary turn.

Copernicus’ heliocentric theory and Darwin’s theory of revolution were both revolutionary truths. They were total negations of deeply rooted past-truths. The birth of revolutionary truths usually requires a process of gradual acceptation; they not only emancipate the mind but also propel the further development of human society as well as science and technology. A revolutionary truth not only affects its own field but also affects all aspects of human society.

2. Revolutionary Theory: Revolutionary theory refers to the revision, summary, and systematic improvement of past theories in order to form new theoretical explanations and push science to a new level.

Revolutionary theories are not a total negation of previous mainstream theories (it may be a total negation of past technologies), but rather an inheritance and development of past theories. They reject the unreasonable parts of past theories and introduce more practical and dynamic components. Revolutionary theories may also be a comprehensive summary and systemization of past theories.

The theory of relativity was a revolutionary theory. It inherited and further developed Newtonian mechanics. The establishment of genetics was also a revolutionary theory. It summarized, systemized, and improved upon past achievements in biological inheritance to form a new discipline.

Revolutionary theories will inevitably promote a series of scientific and technological revolutions. There would have been no atomic bombs without the theory of relativity, and genetic engineering would never have been possible without the study of genetics as foundation.

There is no hierarchy between revolutionary truth and revolutionary theory. Revolutionary theory emphasizes the theoretical advancement of its field, while revolutionary truth impacts human society in a major way.

Revolutionary theory can be separated into major revolutionary theory and discipline revolutionary theory. Modern science can be divided into many branches with many levels of sub-disciplines, and every discipline has the potential to produce revolutionary theories.

Science advances in an undulatory motion. Though specific future achievements are difficult to predict, there is a pattern to scientific development and scientific breakthroughs. We will refer to it as the breakthrough cycle of scientific theories (breakthrough cycle for short).

The breakthrough cycle can be illustrated with the following diagram:

Breakthrough Cycle Diagram

Level One Cycle

Level 1 Level 1 Level 1 Revolutionary

Level Two Cycle

Level 2 Revolution Theory Level 2 Analysis Level 2 Observation

Level Three Cycle

Level 3 Level 3 Level 3 Revolutionary

Level Four Cycle

Level N Level N Level N Revolutionary

a. The first level of the cycle involves the earliest scientific thinking, research, and summarization process. Within this cycle, people will conduct a primary level of observation and research

analysis and reach a level-one revolutionary theory. The establishment of a level-one revolutionary theory is a major scientific breakthrough, and it marks the completion of the first cycle.

A level-one revolutionary theory will guide scientists to conduct level-two observations and analyze the results on a higher level. Scientists will revise, supplement, improve, and systemize the level-one revolutionary theory to reach a second-level revolutionary theory. This is the second level of the breakthrough cycle.

The second-level revolutionary theory will be more complete, more comprehensive, and more in-depth. It will serve as a guide for third-level observation, analysis, and revolutionary theory. The breakthrough cycle will continue onward to the third level and so forth and so on, all the way to level N.

b. The breakthrough cycle can be divided into large cycles and sub cycles. For example, electromagnetism follows the breakthrough cycle under its umbrella field of physics.

As a branch of physics, electromagnetism breakthroughs can only be classified as sub-cycle breakthroughs in physics; they contribute to the overall advancement of the field.

Electromagnetism also has its own branches. Though it counts as a sub-cycle of physics, it is the larger cycle to its own subdivides.

c. The path of science is a process, not a leap. The breakthrough cycle happens gradually; every link in the cycle paves the way for future breakthroughs. No part of the cycle is dispensable; that is true for both scientific theory and technology.

It is precisely this gradual nature of scientific development that limits our forecast of the future. We are often confined by today’s scientific levels when judging future prospects, and that often leads to serious underestimation of future scientific threats.

d. Ordinary people experience the breakthrough cycle differently than scientists. Ordinary people tend to be more perceptual, while scientists tend towards rationality; therefore, ordinary people will lag behind in terms of understanding.

Regardless, the birth of a revolutionary theory will always encounter contradictions and disbelief from ordinary people and scientists alike. Set views and traditional beliefs often make it difficult for people to accept new, revolutionary leaps. This phenomenon denotes people’s tendency to disagree with leaps in science development. We will call it “leap disagreement” for short.

Most of us have this leap disagreement mentality. Even today, many people firmly believe that current scientific theories are close to the ultimate truth, and it seriously affects how we assess the future of science. Another contradictory phenomenon also sounds the warning bell: the increasing numbness to emerging scientific and technological achievements.

When photography was first invented in the early 1800s, it took hours of posing to take a picture, yet people were still willing to try. When X-rays were first discovered, it was the talk of the town, and everyone wanted to see their internal structures with X-rays. When electric lights were still in the experimental phase, they stunned the reporters speechless. However, new inventions and discoveries today no longer arouse such sensation. People are so used to the innumerable products updated every day that breakthroughs have lost their shock value.

At the same time, inventions in the past usually attracted universal attention and discussion. While the novelty of the invention was being discussed, its future prospects—negative and positive—would also be discussed.

Today, people have experienced atomic explosions, moon landings, and artificial intelligence defeating human Go masters, so nothing seems to be shocking anymore. As the novelty factor fades, discussion of future prospects and potential harms wans as well. We will call this general numbness toward scientific and technological achievements "developmental numbness."

Developmental numbness also stems from this factor: scientific and technological achievements are usually assessed by scientists or researchers with their own agendas. The positive outcome of the assessment may serve to improve career, status, or research funding; therefore, the dangers of scientific achievements are usually downplayed in favor of human interests. At the same time, the enterprises (including research institutes and schools) that fund scientific research usually wish to benefit from the results. They will likely acquiesce to potential harms or even encourage the researchers to negate and tone down discussion of potential dangers.

Developmental numbness will inevitably lead to crisis numbness. Once all scientific and technological achievements are accepted as a matter of course, the negative factors of such achievements will also be overlooked. Catastrophe often arises out of such numbness. While waters may be calm before a storm, undercurrents are usually just under the surface. When the whole society becomes numb, devastation may be just on the horizon.

Two: The Fission Acceleration of Scientific Development

In today's society, people often find it difficult to keep up with the times. The pressure to keep learning is constant. Every time we wake up, there seems to be new ideas and inventions springing up, which is why we often call this the era of knowledge explosion. Indeed, this is not just a time of knowledge explosion but also a time of scientific explosion. Science is developing at an increasingly fast pace due to the fission acceleration pattern of scientific development.

The fission acceleration pattern can be described as follows: The development of science inevitable leads to the emergence of various scientific theories and branches that develop on their own according to the breakthrough cycle. Once these theories and branches develop to a certain level, they subdivide and branch out once more, repeating the process over and over. Science develops in a fission-type acceleration process, producing a scientific explosion that snowballs in

power.

Take physics as an example. Modern physics was primarily composed of mechanics and astronomy; the two are subdivided into electromagnetics, optics, thermal science, acoustics, statistical physics, particle physics, nuclear physics, solid-state physics, and more. Each of these disciplines subdivided into secondary, tertiary, and even quaternary categories. Looking back at the branches of science today, it would be difficult for anyone to count the exact number of disciplines, let alone their numerous subdivides.

From the breakthrough cycle ’ s point of view, it is precisely the subdividing and further branching-out of these disciplines that creates the great power behind scientific development. Every new revolutionary theory is bound to create even more explosive energy than the last. It should be especially noted that the subdivided categories will also affect their parent field and related categories, possibly resulting in completely new and independent science disciplines. The emergence of biology was one such divide. No one can predict the extent of the threat posed by these new disciplines, and the survival of mankind teeters precariously as a result.

SECTION FOUR: EXTREME MEANS WILL BE EMPLOYED

One: The ‘Three Increases” of Extreme Means

We will separate the means of killing into three types according to their power levels: total extinction, destruction, and general murder. The “extreme means” here refers to total extinction.

Total extinction refers to killing methods that can result in the overall extinction of humanity, leading to the total annihilation of the human race.

Destruction refers to killing methods that can cause mass casualties (at least thousands and reaching tens of millions) in a generally crowded area (rather than in a highly concentrated area) with one use. If such means are weapons designed specifically for killing, they can also be referred to as weapons of destruction.

In addition to being highly lethal, destructive killing methods must also directly achieve a maximum body count with one use in a normally populated area. Indirect casualties caused by a series of attacks do not satisfy the requirement, nor do attacks in densely populated areas. Even normal weapons are capable of causing massive damage in highly populated areas or through multiple uses. Nuclear weapons and GMO weapons all count as destructive killing methods, and they can cause mass casualties in normally populated areas with one attack.

Some other means may be capable of causing high body counts, but they do not necessarily count as destructive methods. For example, crashing into a building with a plane does not count as a destructive killing method; it mainly causes indirect death through the collapse of a densely populated building. We call the 9/11 terrorist attack a destructive event, but planes cannot be designated a destructive means of killing.

Ordinary explosives caused tens of millions of deaths in World War I and World War II; however, since they caused damage through numerous occurrences instead of a single incident, they do not count as destructive means either.

When a destructive method of killing becomes dangerous enough to exterminate the human race, it becomes a method of total extinction. Total extinction methods do not need to be direct or single use. As long as they can achieve the destruction of the entire human race, they earn the title.

Realistically speaking, if a method required thousands of uses to exterminate humanity, it would not be a successful method for total extinction. Human survival instinct would find a way to stop the method before it reached its extinction quota. Only killing methods that could destroy humanity quickly and efficiently would be eligible as means for total extinction. Obviously, we have only mastered destructive killing methods and not total extinction methods. Destructive means are the most extreme means we currently have.

For distinguishing purposes, we will call all non-destruction and non-extinction methods of killing "general murder methods." For the vast majority of human history, general murder has been the most extreme means of killing. We have only possessed destructive means of killing for seventy years (signified by the explosion of the atomic bomb).

The three increases of extreme means refer to the inevitable development trend of extreme means. That is, extreme means will increase continuously in three aspects: type, power, and controlling personnel. Whether extreme means are in the stage of total extinction, destruction, or general murder, they will all conform to the rule of three increases.

The ancestors of mankind used sticks and stones to fight among and kill each other; this was the extreme means of that time. Due to its low efficiency, it is naturally categorized as general murder. The general murder means possessed by humans millions of years ago and sixty years ago are vastly different. The types evolved from sticks and stones to stone axes and bows and arrows; from swords and spears to muskets and artillery, followed by missiles, tanks warships, aircraft, and so on. The progress of science and technology drastically increased the number of extreme means. Before extreme means progressed from the general murder stage to the destruction stage, its variety was already endless.

Once the explosion of the atomic bomb raised extreme means into the stage of destruction, people immediately began to expand upon the possibilities of nuclear fission, and the second-generation hydrogen bombs and third-generation neutron bombs followed. Fourth-generation nuclear bombs are on most countries' research agendas as well. This is a clear indication of extreme means' increase in type and variety. Though nuclear disarmament talks have been carrying on steadily, this trend still persists.

Additionally, breakthroughs in genetic engineering have not only been used to benefit mankind, but they have been applied to killing. GMO toxins have become another component of destructive means of killing.

After artificial intelligence started achieving considerable results, some countries immediately started considering using them as robotic combat alternatives for war. This type of weaponized robot would be terrifying. There is no doubt that as long as science and technology continue to develop, extreme means will continue the trend of diversifying and multiplying.

At present, humanity has not yet mastered total extinction methods of killing, but such methods will inevitably emerge with continued scientific and technological development. It is logical to assume that future total extinction methods will follow the same pattern and increase continuously in type and variety as well.

As extreme means multiply in type, their power will surely increase. Missiles and artillery obviously cause more destruction than earlier sticks and stones. The earliest atomic bombs had power equivalent to ten thousand tons of TNT, while the largest hydrogen bombs now have power equivalent to fifty-six million tons of TNT. This dramatic increase in power is extremely obvious,

and the developmental trend is easy to understand.

Once the power of destructive methods increases to a certain extent, it has the potential to become a method of total extinction. Total extinction methods vary in power as well. Those that require many personnel, multiple launches, and are difficult to operate are primary, low-level methods of total extinction. Meanwhile, the easy to use, easily manned, one-time methods are powerful, high-level methods of total extinction.

As long as humanity’ s enthusiasm for scientific and technological pursuits persists, primary means of total extinction will emerge. With that as a starting point, higher-level methods will emerge and continually update in terms of power. As science and technology continues to evolve in the future, more means for total extinction will surface.

As more types of extreme means emerge, the personnel capable of controlling such means will increase as well. The development of technology and breakthroughs in scientific theory will make the research and production of extreme means much easier and more accessible.

The world’ s first atomic bomb development — the Manhattan Project — took four years to implement, two years of preparation, 2.2 billion US dollars, and half a million personnel. More than five hundred thousand researchers worked on the project, and it used nearly one-third of national electricity. As a completely new weapon, everything had to start from scratch, and enormous investments were required.

Today, the manufacture of nuclear weapons has become much simpler. Well-established theories and techniques have enabled many nuclear physicists to design effective nuclear weapons. Fifty years ago, a study by a US Agency concluded that two ordinary physics undergraduates could design the general structure of an atomic bomb within three months, guided only by public information from the library. Scientists describe the manufacture of nuclear weapons in simple terms as well. A nuclear physicist, a metallurgist, an electronics scientist, and a chemical explosives specialist could direct a group of workers to assemble a nuclear weapon.

If nuclear weapons are still considered to be costly, complex, and easily monitored, then genetic bio-toxins are much easier to control individually. A high-level biologist could independently develop GMO toxins in a laboratory. It would require very little investment and be difficult to monitor. Artificial Intelligence would also be relatively easy for an individual to develop into an extreme means of killing.

Looking to the future, it is inevitable that only a few countries or individuals will initially possess total extinction methods; however, as science and technology developed further, total extinction methods will increase in type and become easier to obtain by a wider scope of people. As long as humanity exists, this trend will not change.

Two: Types and Features of Killing

Those who witnessed the 9/11 broadcast live will probably never forget that imagery. In the aftermath, people cannot help but wonder what could possibly motivate attackers to do such a thing. What kind of "wisdom" guides them in turning ordinary modes of transportation into weapons of mass destruction? And how was the attack so well coordinated that four planes were hijacked simultaneously to accomplish their goal? From history, we can see that although there are no precedents for hijacking four aircraft at once, large-scale suicide attacks are not uncommon. Individual suicide attacks occur even more often.

We know that human killings can be divided into two categories: war and criminal homicide. War has existed since the formation of human society; it is the conflict between groups and generally takes place on a large scale. Small-scale massacres held in secret are also a component of war. Criminal homicide is a more personal attack by individual criminals or small groups of criminals. It defies national laws and social justice; some instances are secretive and small-scale, while others are mass public killings.

The occurrence, development, and methods of war are largely influenced by the character and ideology of rulers. The good and evil within the rulers' nature is a deciding factor in the characteristic of the specific wars.

In human society, criminal homicide is the most common and frequent type of murder. The inherent evil within human nature and the enormity of the human race means that some people will always deprive others of their lives for various reasons. The motives for criminal homicide can be divided into the following four categories:

1. Financially motivated homicide. The purpose of such crime is to obtain the victim's wealth and belongings. Robbery homicide and abduction homicide fall into this category.

2. Revenge killing. This type of homicide usually results from deep-rooted hatred and is perpetuated out of revenge.

3. Mission-based homicide. This type of homicide is usually an execution-type murder that follows specific instructions from an organization. The organizations behind the scenes are the true murderers in these cases. These organizations can be government-backed, ethnic, or religious.

4. Psychopathic killing. This type of murder is perpetrated by extremely dysfunctional people who may have abnormal psychological traits, mental illnesses, or have been affected by nefarious religious ideologies. They regard killing as a form of pleasure and enjoyment, or a sense of personal obligation and responsibility. They may or may not be lucid when committing the murders, and their victims are usually innocent civilians.

Some other psychopathic killings are committed by people suffering set-backs or extreme hatred who turn their anger towards certain groups or even all society, entire countries, entire races, entire

religions, or all of humanity. These perpetrators kill innocent people to alleviate the resentment and hatred within them.

By studying homicide cases, we can see that the most serious murders are usually either mission-based or psychopathic in nature. In general, these two types of homicide take up a small portion of all murder cases, but they enact great damage and have widespread effect. The victims in these two types of homicide are usually innocent people who do not even know the perpetrators.

Criminology has another classification system for homicide; within it, two are most dangerous. The first is serial homicide, in which criminals kill frequently over a period of time and create a high body count. For example, the 2002 DC sniper attacks that took place in the US caused many deaths in a succession of days and seriously affected people's normal life and work schedules. In 2007, the Russian police arrested a man who had killed more than sixty people in a few years, most of whom were elderly. From September 2000 to April 2003, a Chinese man struck twenty-six times and killed sixty-seven people. These were all serial homicides.

The other type is mass murder, which refers to crimes that cause massive deaths and injuries in one strike; 9/11 is a typical example of mass murder. It caused over three thousand deaths and shook the world. The subsequent wars in Afghanistan and Iraq were all directly or indirectly caused by this incident.

Both serial homicide and mass murder are usually either mission-based or psychopathic in terms of motivation. In the above examples, the murderers either killed out of psychological abnormalities or because they were following orders.

Psychological analysis of murders shows that when someone is driven by evil beliefs, there is nothing they will not do. Some criminals voluntarily surrender themselves in order to publicize their actions; some criminals disregard their own lives to commit suicide attacks or kill themselves after the act, while some criminals even turn upon those closest to them and murder their own parents, children, or siblings.

Some sinister religions encourage their followers to commit mass suicide as a sacred pursuit. In November of 1978, the US-based Peoples Temple Agricultural Project (better known as "Jonestown") encouraged its communes to commit suicide collectively, resulting in 918 deaths. Among the deaths was one member of congress and the cult leader himself: Jim Jones. In October 1994, the Geneva-based Order of the Solar Temple directed three mass suicides in Switzerland and Canada, resulting in fifty-three deaths, including that of the cult leader.

Many such cults exist in the world. They encourage people to seek liberation through suicide and organize mass suicide events every few years. These large-scale acts of suicide are, at their root, criminal homicides motivated by psychopathic mentalities.

Three: Corollary: Extreme Means Will Be Employed

By saying that extreme means will be employed, we mean that the most advanced murder techniques will be used. Even if no one is using such techniques within one period of time, they will be used sooner or later. This does not mean that every type of extreme means will be employed, but that one type will be used at some point. Since we are discussing the issue of overall human survival, we will focus on the inevitable employment of total extinction methods.

1. There are those who dare to use extreme means at any given time.

At any given time in human history, there are a number of people who harbor motives for killing. These people may wage wars or commit criminal acts. They each have different expectations for killing (hereinafter referred to as expectations) and can be separated into two cases accordingly.

The first case is limited killings. This type of killing has a limited number of victims and does not seek the elimination of mankind. It can also be divided into two sub-categories.

a. Murder on a small scale. This refers to targeted attacks directed towards individuals or small groups that happen on a small scale. This type of murder is usually perpetuated by criminals with various intents, but they may also occur in war time.

b. Murder on a large scale. As the name suggests, this type of killing aims for mass casualties. They can be clearly targeted attacks (war is a typical example) or mass murder for no clear reason (for example, psychopathic murder for pleasure).

The second case is unlimited killings. This type of killing seeks to achieve as high a body count as possible, and the murderers usually commit suicide during or after the attacks. This type of murder is usually carried out by psychopathic individuals. Some of them are driven by cult religions, some are motivated by intense hatred, and others are in a state of complete insanity or hallucination.

In order to achieve different expectations, different methods of killing must be employed. When it comes to limited killings, general murder means are enough to accomplish murder on a small scale, while destructive means and total extinction means are certainly not necessary. Large-scale murders can be accomplished through one application of a destructive means or multiple applications of general means. Generally during war, groups will take into account the negative effects of destructive means and avoid them. Meanwhile, individual criminals will choose the most lethal ways possible, and sometimes that includes destructive means (but not total extinction means).

When it comes to the case of unlimited killings, only total extinction means can achieve the expectation of the perpetrators. When total extinction means are not available, the murderers will seek the methods that can create the greatest possible destruction. That is to say, they will seek the most extreme means of that era, as long as they can be acquired.

Extreme means are also preferable to murderers because they are highly publicized and garner much attention from the entire society. Those who have limitless expectations in their crimes will always think of such extreme means when choosing their weapons.

The above analysis shows that not only do people with murderous intent exist at all times, but some of them will require extreme means to achieve their goals. They will most likely be extremely dedicated to the acquisition of the most deadly and extreme methods of killing.

It must be stressed here that we are focusing on the issue of human extinction in this book. Those who dare to use total extinction methods must be those with limitless expectations of murder. They are only a very small portion of society. The various social systems designed by human society are dedicated to further reducing the number of such extreme individuals; however, due to the inherent weaknesses of humans as a species, even the best legal and moral systems cannot constrain and rationalize everyone. We can seek to perfect social systems to reduce the number of extremists as much as possible, but we cannot hope to eradicate them completely.

Chapter Seven Self-Destruction (Part II)

Analysis in the previous chapter has demonstrated that as long as the development of science and technology does not cease, humanity will eventually self-destruct. Scientific and technological development is bound to produce means for total extinction, and once produced, such means will be used.

Since the overall survival of mankind is crucial, the evidence of self-destruction should be as ample as possible. We will further analyze human self-destruction from some other perspectives in this chapter.

Strictly speaking, any living organism must experience life and death. If mankind's extinction was far in the future, worry might be unnecessary, but if it were imminent, there would be reason for concern. All other issues in the world today are secondary to the matter of human survival; therefore, we will be delving into some related issues regarding the self-destruction of humanity.

SECTION ONE: EXTREME MEANS CANNOT BE OFFSET

Our previous discussion has led to one clear conclusion: the extreme means we currently possess are destructive means, but total extinction means will emerge and be applied in the future. One day in the future, we will be exterminated by such extreme means.

Human nature tends to hope for the best and avoid thinking about crises. Faced with such pessimistic prospects, people may wonder if there is a countermeasure to offset and balance the damage caused by extreme means. There are indeed many opposites that achieve balance in nature. In Newtonian mechanics, when force is applied to an object, a reaction force is also produced; nuclei have positive charge, while their outer layer electrons have negative charge; according to the Big Bang theory, antimatter must exist alongside matter; compound reaction and decomposition exist together in chemistry; differentials and integrals concur in mathematics . . . and the list goes on.

Due to the existence of so many positive-negative balances in nature, many philosophers and politicians like to theorize that a similar balance will exist to offset the worst damages caused by humans. The idea is that some sort of counterbalance or restraint can always be created to offset the damage perpetrated by scientific and technological development—just like how shields can stop spears, or how penicillin, erythromycin, and spiramycin can treat inflammations.

Realistically, it is impossible to offset means of destruction and total extinction for the following reasons:

First, it takes time to develop a counter-method. Take cures for genotoxins as an example. A period of repeated experimentation and research is required to produce a solution to any genotoxin attack. During this process, many people will die and the damage will already have been done.

Second, some means cannot be counterbalanced. Of the destructive means that we currently possess, nuclear bombs cannot be offset in any way. Based on current scientific theory, there is no power that can eliminate the energy produced by a nuclear bomb after it explodes. The only way to stop a nuclear bomb from creating mass devastation is to stop it from exploding in the first place. Nuclear bombs can only be classified as a destructive means; there are bound to be total extinction means that cannot be counterbalanced in the future.

Thirdly, even in the most ideal situation where all extreme means can be offset, the time gap between the counterbalance and the extreme means will still be problematic. The time lag between the production of an extreme means and the creation of its countermeasure will accumulate as more extreme means are developed. This will cause humanity to be unprotected for long periods of times. Even in the most ideal situation, the damage brought about by extreme means cannot be eradicated—only reduced. Once means of total extinction emerge, they could destroy humanity with one strike—before a countermeasure can be produced.

SECTION TWO: UNINTENTIONAL DISASTERS

One: Accidents from Experiments

Means of total extinction may not necessarily emerge from people with homicidal motives. Accidents from experiments can also cause human extinction. We know that many great scientific discoveries were unintentionally derived during experiments. Due to the uncertain nature of science, many accidental discoveries have proven to be even more important than the initial research goals that led to their discovery.

The discovery of X-rays—known as one of the three major physics discoveries in the nineteenth century—was discovered by accident. At the time, many physicists were engaged in the research of cathode rays, including German physicist Wilhelm Röntgen. When Röntgen accidently placed a bag of photographic film beside laboratory equipment, the film reacted. This incident started Röntgen thinking and he conduct repeated experiments, finally confirming that it was indeed the previously unknown X-ray that had penetrated the film wrapper.

The discovery of X-ray had great scientific value. X-ray not only propelled the development of physics but also played a significant role in the development of medicine. Roentgen himself was awarded the first Nobel Prize for his discovery.

The discovery of penicillin was also accidental. British pharmacologist and microbiologist Alexander Fleming had been committed to the prevention and treatment of wound infections, but he had not gained useful results in years of painstaking research. One day, he discovered a blank space around the bacteria he had cultivated; the Staphylococcus aureus that caused infection had

disappeared. Further research showed that the Staphylococcus aureus had been killed by a type of mold that was only toxic to bacteria and not to white blood cells. This made the mold useful in treating human diseases, and Fleming named it penicillin.

Penicillin saved countless lives in World War II and became known as one of the three major inventions of that conflict, along with radar and the atomic bomb. It is still a cure for various inflammations today, and Fleming was awarded the 1945 Nobel Prize for his discovery.

Accidental scientific discoveries are numerous—after all, Newton discovered gravity when inadvertently observing apples falling from trees. However, not every accidental discovery benefits humanity. There are just as many examples of catastrophe brought on by accidents.

American politician and scientist Ben Franklin was very interested in electricity. When he observed the sound and light emitted from the Leyden jar, he thought of lightning and set out to discover whether the two kinds of electricity were the same. Franklin fashioned a kite out of silk and tied a thin piece of iron wire to it; he succeeded in "capturing" lightning and proved that it was the same as geo-electricity.

It is in fact extremely dangerous to capture lightning through a kite. Franklin only avoided catastrophe out of sheer luck. Others were not so fortunate. One year after Franklin's experiment, Russian physicist Georg Wilhelm Richmann was killed by lightning while conducting the same experiment with his students. Franklin himself was almost killed in a later electricity experiment. When he was trying to electrocute a turkey with a Leyden jar, he shocked himself. After he woke up, he joked, "I have lately made an Experiment in Electricity that I desire never to repeat . . . I then felt what I know not how well to describe: as universal Blow thro'out my whole body from head to foot . . ."

Scientific experiments have often ended in catastrophe. Nitroglycerin is a potent explosive. After its invention, it was used widely in mining, road construction, and other fields. This type of explosive was unstable and complicated to produce. Nobel was dedicated to improving the safety and simplifying the production of this explosive; his younger brother assisted him.

On September 3, 1864, when Nobel's younger brother and several technicians were studying simplified production methods, an explosion occurred and his younger brother and four others were killed on the spot. Nobel himself escaped the disaster because he was not present at the time.

After the incident, Nobel did not give up his research on nitroglycerin. He finally discovered that diatomaceous earth could absorb nitroglycerin and enable its safe transport, prompting him to start improving the explosive and its detonators. However, another accidental explosion caused him grave injuries, and Nobel barely escaped with his life.

Accidents usually happen because the science is still unknown. This inherent uncertainty of science means that no scientists can completely determine the outcome of scientific experiments, so accidental discoveries and catastrophic disasters will both occur during scientific experiments.

In March 2008, US nuclear safety officer Walter Wagner and Spanish journalist Luis Sancho filed a lawsuit in the Federal District Court of Hawaii, demanding that the atomic crash tests conducted by CERN in the outskirts of Geneva be stopped.

Physicists had spent fourteen years and eight billion dollars building the Large Hadron Collider (LHC) in the outskirts of Geneva. They were planning to study the debris left from proton collision to find clues regarding the essence of mass and nature. Wagner and Sancho believed that the physicists had underestimated the LHC's danger, and that it could create globe-gob-bling black holes, strangelets, or other exotic and catastrophic phenomena.

This was not Wagner's first lawsuit. He had filed suits against the Brookhaven National Laboratory in 1999 and 2000 in an attempt to stop its trial of the Relativistic Heavy Ion Collider; however, his lawsuits were dismissed and no accidents occurred during the RHIC experiments.

Wagner and Sancho's lawsuits were dismissed as well. According to famous physicist Stephen Hawking, even if a micro-black hole were formed through such experiments, it would evaporate immediately. Hawking's theory is still unproven, and it is this uncertainty that worried Wagner and Sancho. Many scientists have expressed concerns over high-level scientific experiments. When the first atomic bomb was being tested, scientists were worried that it would ignite the atmosphere. Subsequent tests prove this worry to be superfluous, and the LHC did not bring any disaster either. However, concern over scientific experimentation will never be unfounded. With the deepening exploration of science, more advanced levels of science and technology are bound to increase in power and ultimately possess the ability to exterminate humanity.

There is no doubt that no sane scientist will set human extinction as their research target, yet scientific research may not always progress as intended. It is entirely possible that some accidental occurrence will divert the path of research and result in some catastrophic outcome.

Scientific development still has a long road ahead, and future breakthrough will no doubt be more advanced and formidable. As such, the demons released through scientific accidents will be more terrifying as well. Our fears of scientific accidents only need to be fulfilled once for the doomsday of humanity to arrive.

Two: Misuse of Scientific Products

Uncertainty is one of the basic characteristics of science and technology. Many scientific products have already been manufactured and widely used, but their performance and safety are still hard to accurately predict. There have already been cases where misuse of products has caused catastrophe. As science continues to advance, these catastrophes will only escalate.

Catastrophic consequences caused by misuse of scientific products are numerous, so we will only name a few here. The devastation of the ozone layer was caused by Freon. Today, the world is limiting and will ultimately terminate the use of Freon. When Freon was first invented by the DuPont Company, it was highly regarded by scientists and even deified in some circles. Due to

Freon's non-toxic, non-flammable, stable and non-corrosive (to metals) characteristics, it was widely used in the refrigerating industry and many other fields. It was not known until later that Freon's stability would cause irreparable damage to the ozone layer. We have discussed this in previous chapters.

The use of DDT stemmed from similar carelessness. Swiss chemist Paul Hermann Müller had dedicated himself to the research of pesticides since 1935. He discovered that DDT had a strong and long-lasting effect on insects but was non-toxic to humans and livestock. As a result, DDT became the first widely used organic synthetic insecticide, and Müller won the 1948 Nobel Prize in Physiology or Medicine.

Ten years later, the negative effects of DDT were revealed. Insects developed DDT resistance after a period of time, but their natural enemies had already been killed by then. As a result, pests became more rampant. DDT also caused eggshells to become thin and brittle, causing many bird species to be harmed. DDT also proved to be harmful to humans, as it could affect fertility in men.

Due to these hazards, all countries have stopped the use of DDT; however, since DDT is insoluble in water and its toxicity decays very slowly, its harm has lasted even thirty years after general termination. Thirty years later, DDT is still found in human and bird bodies, and even in penguin bodies in the Antarctic.

Catastrophe from scientific product misuse also results from premature application of products that have not been thoroughly studied. Such examples are too numerous to count. On December 3, 1984, a cyanide leak at a pesticide plant in Bhopal, India, resulted in twenty-five thousand direct deaths and 550,000 indirect deaths. Two hundred thousand more were left permanently disabled. The casualties of this incident rival that of a large-scale war.

The nuclear accident at the Chernobyl nuclear power plant in Kiev, Ukraine, and the nuclear power plant leak in Japan are still causing lasting damage, years later.

After the initial development of a scientific product, scientists usually have trouble determining its absolute safety. The more advanced the product is, the more uncertain its safety will be. Correspondingly, the more advanced a product is, the more destruction it will bring in the event of misuse. One day the destructive power from scientific product misuse will be enough to wipe out humanity.

Once scientific development advances to achieve total extinction capabilities, we not only have to guard against targeted attacks by psychopathic individuals but also inadvertent accidents in the laboratory and misuse of products. One conclusion becomes clear: due to its inherent uncertainness, once science and technology advances to a certain degree, total extinction will become inevitable. The only way to avoid human extinction is to stop scientific and technological development before it has the power to exterminate mankind.

SECTION THREE: THE TIMEFRAME FOR HUMAN EXTINCTION

Fundamentally, as a biological species, humanity must follow the natural procession of creation to destruction. The force of nature can destroy any living thing in the end, and humanity is no exception. From the analysis in chapter three, we know that our natural extinction date should be about five billion years in the future. That is a very long time away, and it gives us little cause for concern.

If the self-destruction timeline for humanity were similarly remote, we would have nothing to worry about. However, if that timeline were mere centuries away, we would be compelled to take immediate precautions. With such a limited timeframe, any adjustments would have to happen as soon as possible; therefore, we should carry out a serious analysis of the timeframe for human extinction.

At the level of science development today, technological advancements can no longer rely solely on intuitive experience, as the guidance of scientific theory has become indispensable. Science and technology first combined during the Industrial Revolution, and people soon discovered that scientific theory was crucial in the further development of technology. Only through theoretical guidance could productivity achieve real increase and more high-end products be developed; therefore, whenever scientific theories achieved breakthroughs, people tried to apply them to new technological products.

Numerous scientific and technological practices reflect one objective fact: Whenever a medium-level theoretical breakthrough occurs, the series of technological products derived from it greatly changes people's lifestyles. Whenever a high-level theoretical breakthrough occurs, the series of products derived change the world. This change can be beneficial or harmful to humanity. For these reasons, we can roughly infer the timeframe for human extinction by using breakthroughs in scientific theory as a main line.

Based on current scientific theory, we can already infer that the means for total extinction will emerge. The aforementioned self-awareness of artificial intelligence, unethical use of nanobots, asteroid collision, and other factors are all extinction possibilities derived from existing scientific theory. Current scientific theories are still at a limited level, and corresponding means for extinction may take some time and effort to produce—but they will be achieved eventually. For example, the further development of artificial intelligence could be enough to exterminate mankind in another few decades.

The more frightening prospect would be major breakthroughs in scientific theory that could easily produce means for total extinction. Let us make some inferences for this possibility. Since physics has always been at the core of natural science, we will use the development of physics as a reference and follow the fission-acceleration law of scientific breakthrough cycles to conduct our analysis.

The achievements of Galileo marked the beginning of modern physics. It was the first-level breakthrough in the development of modern physics. Logically, Galileo's achievements should have led to major scientific and technological developments and greatly impacted human

society—that was not the case. This was because Galileo's discoveries took place 150 years before the Industrial Revolution, and people had not yet realized the significance of applying scientific theories to technological practices. However, this does not downplay the power of this first-level revolutionary theory.

Newtonian mechanics was the second-level revolutionary theory of modern physics. Its impact was manifold, but the most prominent impact was its impetus to the Industrial Revolution. What we generally refer to as the Second Industrial Revolution was the stage of the Industrial Revolution in which scientific theory and technical practice successfully combined. This stage held the true explosive power of the Industrial Revolution, and Newtonian mechanics played the most important role.

The guiding effect of Newtonian mechanics and its deep impact on human society did not emerge immediately. It took one hundred years. One reason for this is the inherent time lapse between the establishment of a scientific theory and its practical application. In addition, the idea of combining scientific theory and technical practice did not take root until half a century later, when the Industrial Revolution took place.

Today, we can clearly see the profound changes brought on by the Industrial Revolution and the unprecedented wealth it created. That is more than enough to illustrate the power of revolutionary breakthroughs in physics—Newtonian mechanics in particular.

The theory of relativity and quantum mechanics was the third-level revolutionary theory of modern physics. This theory was born in the early twentieth century. It had tremendous power but was also technically difficult to mobilize. Marked by the explosion of the atomic bomb, this third-level revolutionary theory only took forty years to move from theory to practice because people had fully realized the importance of guiding technical practices with scientific theories and devoted great energy to the matter. This clear and universal recognition also meant the people were willing to invest heavily.

Two examples best sum up the enormous energy generated by these three levels of theoretical breakthroughs in modern physics. First, man has landed on the moon. We are preparing to land on Mars, and unmanned aircraft have flown out of the solar system. Second, hydrogen bombs today have energy equivalent to over fifty-six million tons of TNT. In the above achievements, the main guiding theory was the theory of relativity and quantum mechanics.

Based on the above analysis, the fourth-level revolutionary breakthrough in modern physics should be enough to guide the production of total extinction methods. The technological achievements gained through the first three levels of revolutionary breakthroughs has brought humanity one step away from means of total extinction. Technical difficulty is the only issue that remains.

As the core subject of natural sciences, the fourth major breakthrough of physics would hold much more power than the first three. Since we have already approached methods for total extinction at

our current stage, it logically follows that a further fourth stage would achieve such means quite easily. The question becomes: How long will it take to achieve the fourth major breakthrough in modern physics?

It took less than one hundred years for Galileo's physics theories to progress to Newtonian mechanic, and the leap to the theory of relativity and quantum mechanics took about two hundred years. We can infer the fourth step in the cycle based on this timeline. Theoretical breakthroughs in science do not happen overnight; they are the accumulated results of numerous scientists over generations. Since the fourth major theoretical breakthrough will be more advanced and require more accumulation than the third breakthrough, it will probably require more time as well.

We cannot consider this issue in isolation. We all know that science advances in a fission type acceleration, and that it is constantly branching out to form new categories and subdivides. Every one of these subdivides is being studied by scientists, meaning that the results are accumulating at an increasingly fast pace. This supplements the fourth major breakthrough's need for scientific result accumulation and shortens the time gap considerably.

Even so, we should still set the timeframe for the fourth major breakthrough in modern physics to be longer than its predecessor. The theory of relativity has been established for over a century now. According to the breakthrough cycle, we can reasonably assume that the fourth breakthrough will occur in the next century and a half. If we also consider the time needed for theory to move into application, then we can conclude that means for total extinction will definitely appear in the next two centuries.

The above inference is obviously quite conservative for a few reasons. First, we have not considered that total extinction means based on existing theory may come earlier; also, we have not considered that means of total extinction may emerge faster in fields other than physics. Atomic bombs were a product of physics, but the equally lethal genotoxins were a biological product.

In the very beginning, means for total extinction may be in the hands of a few heads of state or more benign persons; however, the three increases of science development tells us that total extinction means will multiply in power and variety and eventually trickle down to those willing to use them. At the same time, the continued development of scientific theory will elevate scientific and technological products to a corresponding level. At that time, accidents in labs and misuse of products will threaten human survival just as much as deliberate use of total extinction methods. Once means for total extinction are produced, the fate of mankind will be hanging by a thread.

Even so, we should still try to approximate a timeframe for the application of total extinction methods. Nuclear bombs were used in war immediately after their development. GMT toxins have not yet been used, but it has only been a decade since their development. Most extreme means before this were put into use shortly after their inception. The longest waiting periods did not exceed a few decades.

Of course, means of total extinction will be different from destructive means, since it will guarantee that the users be exterminated as well. No logical, sane individual will apply them. Due to the inherent danger of these means, most rational authorities will also exercise strict control over them. These factors can ensure that total extinction means will not be applied for at least some time after their inception; however, the passage of time will inevitably lead to other factors that promote the use of such extreme means.

First, the advancement of science and technology will lead to more types of extinction methods, and they will follow this trend:

1. Under the guidance of newer, higher-level theory, the development of extinction methods will become easier;

2. Newer extinction methods guided by higher-level theories will be increasingly powerful; and

3. Newer methods of extinction will be smaller, more portable, more user-friendly, and more suited for single-person operation.

Second, scientific theories will not only be applied to killing methods, but they will also be used to manufacture civilian products. Due to the uncertainty of science and technology, we cannot guarantee the safety of all scientific theories. A scientific theory that could support the production of extinction means would imbue great power in its civilian counterparts as well. Such civilian products would have great threats hidden within them, and any misuse could result in catastrophe.

Third, as time goes by, even the most rigid controls will malfunction from time to time. Those vindictive extremists who are hell-bent on destruction will be sure to target these moments of weakness to obtain some weapon capable of total extinction.

The above factors decidedly prove that total extinction forces will only become more prone to erupt as time goes by. After taking all factors into consideration, we can assume that humanity will achieve self-destruction within two or three centuries based on the current rate of scientific development.

By now, a clear warning has become clear: the time to act is upon us. We must resolutely and decisively limit the development of science and technology right away. The timeframe for human extinction is no longer than two or three centuries and may even be as short as one century, meaning that even immediate action may be too late.

Regrettably, the limitations of human wisdom instill in us ubiquitous “leap disagreement” attitudes and development numbness. Humanity is still in the dark regarding the dire situation and persists in underestimating the power and threat of scientific development. Substantive preventive measures are still matters of the distant future. The elites of humanity are happy to enjoy the fruits of scientific achievements and ignore any harm that is not immediately visible. As for the certainty

that science will cause catastrophic damage, none of the most powerful leaders in the world have substantive consciousness. There is really very little time left for mankind!

SECTION FOUR: REVELATIONS FROM EXTRATERRESTRIAL LIFE PHILOSOPHICAL INFERENCE OF SELF-DESTRUCTION

Previous analysis has proven from many angles that continued scientific development will lead to human extinction in the near future. The only possible solution is to limit further advancements of science and technology.

The above discussion has been based on clear and objective inference. We can also look at the issue from a philosophical standpoint. Here we will infer the future of mankind by speculating on extraterrestrial life (aliens).

The planet Earth we live on is one ordinary planet in the solar system. The solar system is within the Milky Way, and the Milky Way is just another ordinary galaxy in the universe. Though the birth of intelligent life on Earth was extremely random, the vastness of the universe makes it reasonable to believe that other intelligent life-forms exist in the infinity of space.

The sun is neither a first-generation star nor a second-generation star. We have reason to speculate that intelligent life-forms may have formed in second-generation stellar systems; that is to say, stellar systems capable of producing intelligent life should have appeared ten billion years ago. Humans existed five billion years after the sun was formed, so we will set the incubation period for intelligent life at five billion years. Therefore, the earliest intelligent life-forms should have existed five billion years ago. If this were true, such highly intelligent beings should have mastered interstellar travel after five billion years of development. However, we have found no definitive evidence of alien visitation.

Earth is a beautiful blue planet uniquely suited for life. Intelligent life five billion years ahead of us could not have missed this. Microbes appeared on Earth 4.28 billion years ago, signaling that Earth had sufficient conditions to facilitate life back then. With such an attractive setting, there can only be three reasons for Earth to have never enticed aliens. First, the distance between stars is too vast for even the most advanced technology to surmount; second, alien life became extinct for some reason before they advanced enough to achieve interstellar travel; third, aliens stopped their scientific development and chose to stay on their own planet. We have speculated about the first possibility in chapter three. We will analyze it from another perspective here.

Humans achieved space flight one hundred thousand years after completing evolution, and traveling outside of the solar system is entirely possible in our near future. If intelligent life five billion years more advanced than us survived, even if it were not possible to achieve large-scale interstellar travel, at least a small portion of them should have reached Earth; thus, we should focus more on the latter two possibilities.

Let us first analyze the second possibility. Could aliens have become extinct before advancing to interstellar travel capabilities? Why would aliens go extinct? Was it due to natural forces in the universe (like asteroid impact or black-hole swallowing)?

Closer consideration would prove the above possibilities to be unlikely. Any planet able to form intelligent life would be fairly stable, so it would take billions of years for natural forces to threaten the existence of intelligent life on this type of planet. Aliens should have developed enough to travel space freely and prevent their extinction in such a long period of time. Furthermore, even if one such planet met some unfortunate end, it would be statistically impossible for every planet with intelligent life to encounter similar natural disasters.

We can only suppose that these aliens became extinct due to internal threats. Judging from the nature of humans, we can deduce that evolutionary imbalance is a universal flaw present in all highly intelligent life-forms. The impulse to discover and transform nature may generate the power to self-destruct in a very short period of time. This inclination to self-destruct may be an inherent balancing force in the universe.

The history and inherent characteristics of humanity makes the abovementioned presumption highly credible. Mankind formed four million years ago, and humans completed evolution one hundred thousand years ago. However, it has only been two hundred years since the urge to conquer and transform nature was fully awoken in mankind. In such a short period of time, humans have already changed the world profoundly. We can only imagine how much more change could take place in another hundred years. The devastating power of future scientific and technological developments is just as unimaginable.

In comparison, the irrational components of human nature have barely changes in two hundred years and show no signs of changing in the future. Humanity's inherent shortsightedness, greed, homicidal instinct, and hatred have not improved with the development of our destructive abilities. Unless some major spontaneous evolution takes place, humanity's rational evolution will continue to lag behind our creative evolution. It is this gap that will eventually result in humanity's self-destruction. If aliens follow this same pattern of behavior, that may explain why we have not encountered them to this day.

The third possibility theorizes that aliens decided to cease scientific and technological development, thereby avoiding extinction and forfeiting interstellar capabilities. What could motivate aliens to take such action? Presumably, alien society, like human society, experienced both the benefits and harm brought on by scientific and technological developments. As these developments advanced, their power and destruction probably increased as well. We can assume that aliens realized the possibility of future extinction and decided to establish strict restrictions to curb the development of science and technology. Hence, aliens never acquired interstellar travel capabilities but live in peace on their own planets instead. Since the universe is extremely vast, and alien life should exist in more than one instance, the above two explanations may apply to different planets respectively.

Admittedly, we have never observed aliens and we do not know of any planets with intelligent life, so the above speculations are pure conjecture. However, though we cannot be 100 percent certain of these hypotheses, a fair amount of logical credibility does exist. This subjective deduction is completely consistent with previous objective inference; therefore, the future fate of mankind cannot be more explicit.

The analysis of extraterrestrial life may also prompt this line of thought: humans have landed on the moon and will soon land on Mars. Travel outside the solar system is also achievable in the near future. From this point of view, it seems plausible to estimate that humans will master interstellar travel in the not-too-distant future; however, analysis of extraterrestrial life also concludes that highly intelligent life-forms will be exterminated by science and technology before interstellar travel abilities are obtained—if not, Earth would have been boarded by aliens already. This sounds a strong warning; the day we achieve the conditions for interstellar travel will also be the day we achieve self-destruction capabilities. This is tantamount to saying that if current scientific development trends persist, human extinction will occur in the not-too-distant future. This conclusion is consistent with our previously deduced human extinction timeframe as well.

Chapter Eight The Only Option to Save Mankind

Previous discussions have all led to the same conclusion: based on current patterns of scientific and technological development, human extinction is inevitable and not too far in the future. Combined with our analysis of external threats, we can clearly see that the threat to mankind comes from within, not without. Faced with this grim reality, what option does humanity have?

SECTION ONE: CORRECT TREATMENT AND UNDERSTANDING OF SCIENCE AND TECHNOLOGY

One: Changing Extinction Views

Since ancient times, mankind's sense of crisis has been directed towards natural or supernatural forces. Floods, earthquakes, volcanoes, and asteroid collisions have been the focus of natural threats, while doomsdays and judgment days have been the focus of supernatural threats. However, people's crisis views underwent historic change with the explosion of the atomic bomb in Hiroshima and Nagasaki. Humans started to realize the extent of destruction they could mobilize, and it rendered former natural and super natural threats less fearsome. An unseen force has been moving humanity closer and closer towards extinction. This destructive force is not a force of nature or supernatural in origin. On the contrary, humanity is driving itself into the abyss of extinction.

The concerned parties in this issue include some of our most distinguished scientists and scholars. Known as the father of the atomic bomb, Einstein spent the last years of his life appealing for this matter and co-published the famous "Russell-Einstein Manifesto" with philosopher and Nobel Laureate Bertrand Russell. A total of eleven famous scientists and scholars signed this manifesto, crying out, "Shall we put an end to the human race; or shall mankind renounce war?" Scientists and scholars like Einstein and Russell believed that with the possession of powerful weapons like the atomic bomb, human existence would be threatened if wars were not renounced.

These were true prophets. They realized the terrible fate that could befall humanity if our irrational behaviors persisted. This was a transcendent view of human extinction; however, these esteemed scholars only attributed humanity's self-destruction to "war," because at the time, nuclear bombs were the most destructive weapons in existence and only countries were capable of manufacturing and using them. When the "Russell-Einstein Manifesto" was published, only the United States, the United Kingdom, and the Soviet Union possessed nuclear weapons. For these scholars, only countries would use such destructive weapons, and only during times of war.

Fifty years have passed, and perhaps it is the fear for mankind's survival that has stopped the outbreak of World War III and the further use of nuclear weapons in war. However, the terrifying speed of scientific development has only increased our fears of extinction. Genetically modified biotoxins have destructive capabilities that are unmatched even by nuclear weapons; a teenage computer genius can invade the US Department of Defense's data base and cause millions of

computers to crash through one virus; self-aware artificial intelligence could easily eliminate humanity; uncontrolled self-replication of nanobots could swallow the entire planet; further development of cloning technology could even achieve human replication. In short, further development of many technologies could result in either extinction or mass destruction of mankind. Moreover, many of these technologies can be manufactured and operated by a small number of people—or even one individual.

This means that the power to decide humanity's survival has gradually transferred from a few major powers into the hands of many human individuals. The inherent characteristics of humanity means that even the best social systems cannot stop such extreme means of devastation from being used.

The atomic bomb warned humanity of the potential extinction that could be caused by wars. Seventy years later, our understanding has undergone a major change. We now understand that in addition to war, crimes, laboratory accidents, and even misuse of technical products may also lead to human extinction. In fact, war poses the least amount of threat compared to the other three. War is a group act meant to kill enemies and benefit the victorious party, so total destruction is usually not the goal. Contrarily, psychopathic crimes are usually committed by people who wish to enact revenge by causing as much damage as possible—they would not hesitate to use methods of extermination.

The unintended catastrophes caused by scientific experiments and products cannot be ignored either. Future scientific research will become much more challenging, and extremely powerful natural forces will be used. It is possible that other disastrous forces will be mobilized in the process. Similarly, as science becomes more complex, the products developed from it will become more difficult to control and predict as well. Any little misstep could be the end of mankind.

Upon deeper thinking, the internal threats to humanity's survival cannot be simply attributed to war, crime, laboratory accidents, or misuse of scientific products. These four can only count as the likely methods for extinction. Their one common root is science and technology. Science and technology are the fundamental forces that will determine the overall survival of the human species.

Two: Restricting the Development of Science and Technology

In most cases, scientific research is to benefit humanity. The negative by products—killing methods—are unintended but unavoidable. Planes were invented to give humans the power to fly, yet they were quickly turned into military aircrafts; genetic engineering started out as a project to improve gene structures in animals and plants, but it was quickly modified to produce agents for biowarfare.

Despite our tendencies to apply science and technology to war before all else, future extinction means will likely not be intentionally created. Means of total extinction would destroy their creator as well, so apart from a few insane scientists and extreme cults, most would not actively

seek out such means. It is most likely that means for total extinction will emerge unintentionally after generations of accumulation. In other words, as science and technology continues to accumulate in power, there will be a last straw that breaks the camel's back.

The only way to avoid killing the camel would be to stop adding more straw. A hundred years ago, extinction would not have been a concern. Science and technology's power only becomes truly threatening after reaching a certain level. Once this level is reached, this power does not just erupt due to intentional application, but it can also be ignited inadvertently. Therefore, we must strictly limit the continued development of science and technology to ensure that it never reaches the level of extinction capabilities. This is the only way to save humanity.

The strict restriction of scientific and technological development should include the following aspects: firstly, the study of natural sciences should be most strictly limited. Any theory without absolute safety assurances must be banned altogether. Any breakthrough within one theory would trigger multiple breakthroughs on complex levels in other fields; the power of such enormous breakthroughs would be impossible to regulate. Atomic weapons would never have been created without the mass-energy equivalence theory, and genotoxins would never have been possible without biogenetic theory.

Secondly, the further technical application of existing scientific theory must be restricted. As long as the situation is not 100 percent certain, further research should cease. After all, one technological breakthrough could produce a domino effect that would be impossible to predict.

Thirdly, when it comes the development of new technology, if potential harms are uncertain, it should be treated as potentially harmful. The survival of humanity outranks human happiness. It is much more important to ensure human survival than it is to strive for marginal enjoyment.

Fourthly, products that have already been developed should be strictly researched before going to market. Existing scientific theory should also be assessed in-depth. If further excavation could bring disaster to humanity, the theory must be permanently shelved.

Fifthly, the gradual nature of scientific and technological development must be taken into account. Means for total extinction will most likely emerge in very accidental circumstances, so we must be constantly vigilant. Scientific and technological breakthroughs cannot progress in leaps; it relies heavily on earlier accumulation. Without Galileo and numerous other physicists, Newton and Einstein would never have produced their theories. To prevent more destructive means from emerging, we must start controlling science and technology immediately and in detail.

The restriction of scientific and technological development must be a consistent long-term process. In the future billions of years of human history, one minor lapse in control could result in the destruction of the human race.

If we look back on the past two hundred years of scientific and techno logical development, we will be shocked by how much we have achieved. Based on this, it is entirely possible to ascertain that a few centuries more of development would lead to human extinction.

Three: A Dialectical Understanding of Science and Technology

The restriction of scientific and technological development is a holistic approach; it is a last resort in the fight against extinction. Restricting scientific and technological development is not negating its positive effects; rather, it is merely a necessary action meant to restrict the corresponding negative threats that may ensue. We are not completely against scientific research and application; in fact, the rational development of science and technology is crucial to human survival and happiness. A dialectical understanding of science and technology is necessary. We must vigilantly guard against potential threats while also exploring possible benefits.

1. Science and Technology Are the Cornerstone of Humanity and Human Civilization

To a certain extent, humans would not exist without science and technology. It is our pursuit of science that evolved us from primate into man. The primitive discoveries of stone tools and fire greatly stimulated the brain's capacity of our ancestors and led them to evolve into the intelligent beings humans are now.

Our ancestors once faced the tests of nature naked like other animals. As they began to sew skins into garments, they not only learned how to keep warm but also began to understand the concept of dignity. Additionally, our ancestors also learned to make decorations out of animal teeth, shells, and other materials. These primitive inventions were an expression of their pursuit of beauty, and they further stimulated a longing for beautiful things.

In essence, science and technology is, in itself, a carrier of civilization. The domestication of animals and plants marked the beginning of agricultural civilization; the use of steam engines and the improvement of textile machines foretold industrial civilization. Without the numerous creations produced by science and technology, there would be no human civilization and no development of humanity.

Primitive humans were interested in music and art, but that was merely a simple pursuit. With the discovery of metals and other non-metallic materials, as well as development of finer processing technologies, a variety of instruments were created. Today, the performance of such instruments is a truly transcending experience.

Scientific discoveries also led to the production of gouache, acrylics, oil paints, and other materials in countless different colors. These varied pigments further expanded the way art was practiced and resulted in some of the greatest masterpieces in history.

The development of science and technology has distinctively separated humans from all other animals in many aspects. We eat, wear, dwell, and act the way we do because of how science and technology has impacted us. It is the reason humans can be known as not only intelligent life-forms but also civilized life-forms.

Science and technology has also served as a messenger for human civilization. The convenient and rapid means of communication, media, and transportation were all fruits of science and technology.

It was science and technology that enabled us to break away from primitiveness and emerge into civilization. Without science and technology, humans would not be the intelligent and civilized species we are today.

2. Science and Technology Are the Cornerstones of Human Survival and Happiness

The significance of science and technology can be found in all aspects of humanity. At present, the human population is seven billion. A species of such huge scale has enormous consumption demands. Just in terms of food, Earth could not have sustained us naturally. Without science and technology, humans would experience extreme food shortages. There would be no happiness to speak of.

In the long run, the rational development of science and technology still has a positive and even decisive role in humanity's overall survival. We all know that science and technology is not the only force that can destroy humanity, as natural forces can do so too. The need to restrict science and technology is more pressing, since its destruction timeframe is mere centuries compared to the billions of years natural extinction will take. However, natural extinction is only distant due to the high level of scientific and technological advancement we have achieved. Without such methods to prevent external threats, we would be in just as much danger from natural destruction. We are only able to devote our efforts towards the threat of science and technology because they have already provided us with the means to circumvent most natural disasters.

Science and technology have also been crucial in safeguarding the survival of human groups and human individuals. For example, epidemics and plagues would have caused greater devastation without developments in medicine. By guaranteeing the health and longevity of human beings, science and technology also contributed to the overall happiness of humanity. The overall improvement in life expectancy—especially in developed countries—and the improvement in overall human health can all be attributed to science and technology. Science and technology also contributed to the way we communicate, dwell, and clothe ourselves. They have significantly bettered our living conditions and vastly enhanced our happiness levels.

Science and technology not only laid the foundation for human survival, but also for human happiness. Their contribution to humanity is unique and irreplaceable. We are not negating all this when we ask for restrictions on scientific and technological developments; we merely believe that

further breakthroughs may be unwise. Though more advanced levels of science and technology may bring even more positive benefits to humanity, their negative effects may also be vast—vast enough to exterminate humanity.

3. Rational Restriction of Science and Technology

In view of the fact that science and technology can both harm and benefit humanity, and that mankind is heavily dependent upon them, a dialectical attitude should be adopted for the rational restriction of science and technology. In principle, when we talk about limiting the development of science and technology, we are merely talking about limiting their harmful side; their benefits should not only not be limited but further promoted. We should observe the following guidelines:

First, existing science and technology achievements proven to be mature and safe should be universally promoted and applied. Today's world population is huge and still expanding. Without science and technology, there would be immediate survival problems for humanity. Scientific achievements that are assuredly safe and mature should be popularized on a large scale to ensure the overall quality of human life. This can help to ensure that humans will live a long, happy life on this planet.

In fact, if safe and mature technologies already in existence are distributed to all corners of the world, it would be more than enough to ensure the essential needs of humanity. Countries like United States, Japan, Germany, the United Kingdom, and France have built strong, powerful nations based off of these technologies, while smaller countries like Luxembourg, Switzerland, Singapore, and South Korea have also established affluent societies based on technological achievements. Even developing countries like China feel the beneficial impact of science and technology. If we spread such mature science and technology results to Africa, Latin America, and Southeast Asia, the positive results would be abundant.

Second, research in specific fields of science and technology should still be furthered. The strict limitation of scientific and technological development is a general requirement. There are still many major technical problems in the future history of mankind; these problems are related to the overall survival and happiness of human beings. Therefore, under the premise of general restriction, topics that are obviously safe and heavily influence human survival and happiness should be further researched.

A typical example of this would be further research to prevent major natural disasters like asteroid collisions or infectious diseases; however, such research must be conducted with the greatest caution to prevent it from permeating into more threatening areas. There are many natural forces that threaten humanity, such as epidemics, earthquakes, volcanoes, floods, and hurricanes. If we mistakenly treat all threats as destructive threats, the efforts to restrict science and technology would come unraveled very quickly.

We should also realize that mankind will have to make some sacrifices when restricting science and technology. Not only will some material enjoyments be reduced, but some research projects

aimed at enhancing survival crisis for individuals and groups will not be easily initiated. For example, research for some drugs that may relieve pain and suffering for certain patients may be restricted to prevent means for destruction from emerging as by-products. In the face of overall human survival, some individual survival and happiness needs must be sacrificed.

When faced with such choices, we must learn to view everyone's life and death candidly and as a natural component of life. This is not saying that we should stop pursuing ways to save those in need ... just the opposite. We must always be devoted to helping our fellow human beings within current science and technology capabilities; it is only further research that must be cautioned.

In addition, some other areas of research should be opened up sparingly. For example, alternative sources for non-renewable resources are crucial to continued human survival on Earth; such research should be allowed to carry on under safe conditions. Of course, the utmost caution must be constantly taken.

Third, the restriction of science and technology cannot be flawless. Scientific discoveries and technological creations have often happened accidentally; even the most rigid restriction systems could not stop such accidents from occurring. Once occurred, such accidental achievements must be carefully screened to determine their potential threat. If they are proven to be safe, they should be promoted and utilized; if not, they must be strictly sealed.

As a whole, the restriction of science and technology should be comprehensive and strict, and it must be continuous and uninterrupted. Further development of science and technology can only take place in the most carefully selected areas with great caution. Scientific and technological achievements should be widely used and promoted, but they must be carefully screened and tested first.

SECTION TWO: THE PREREQUISITES FOR SCIENCE AND TECHNOLOGY RESTRICTION

After determining the necessity of restricting further scientific and techno logical development, we should continue to analyze whether or not we can achieve this goal.

One: Countries Are Today's Social Forms

The social formation of human society has gone through three stages: the primitive migratory stage, the village and tribal stage, and today's nation/country stage.

In the earliest days, when primitive humans lived in migratory groups, there was very little interaction between groups. The Agricultural Revolution brought about the domestication of animals and plants and allowed humans to settle down. Villages and tribes were formed.

Countries formed a few thousand years after the Agricultural Revolution. The earliest country formed some six thousand years ago. The country stage is the third stage of human society development, and it has lasted to this day.

The formation of countries was an inevitable outcome of human society development, and it was based on village and tribal societies. Due to the extreme selfishness and eternal competitiveness of humanity, villages and tribes engaged in constant conflict. Agricultural production also required large water conservancy projects and natural disaster prevention methods. All of these elements gave rise to the formation of countries. Even though today's societies retain the basic form of countries, their essences have changed drastically. Human society today is much more rich and vivid than it was thousands of years ago.

As an organization form of human society, countries are not unique. Many other types of organizations are active in the world. In terms of scale, international organizations are the largest groups. For example, the United Nations is the largest international organization in the world. As a universal international organization, its existing 193 member states include almost all the sovereign nations of the world. In addition to universal international organizations like the United Nations, there are also various regional and trans-regional international organizations, such as the European Union, the Southeast Asia Union, and the G8.

Apart from international organizations, smaller forms of organizations exist in abundance; these include various governments, agencies, enterprises, associations, schools, public welfare agencies, social welfare agencies, and various cities, villages, towns, and neighborhoods. These organizations exist all around us and are inextricably linked to all of our lives.

Two other forms of organization exist invisibly. They connect people by blood or belief and awaken a strong sense of belonging within each individual. These unseen organizations are ethnicity and religion. All people belong to their own ethnicity, and most people have their own religious beliefs. Though people may not necessarily be influenced by a particular ethnic or religious organization, they cannot deny their existence.

Despite this, the most stable, sacred, and systematized organization in human society is still the country. Today's human society exists in country configurations, which are the dominant force in today's world. All other organizations are subordinate to them.

Various international organizations are actually subordinate to countries as well. It is the country's decision to join and act in these international organizations according to their individual interests. International organizations are largely influenced by their member states, especially the more powerful ones. Therefore, countries dominate international organizations ... not the other way around. This is a basic fact.

Similarly, ethnicities and religions are also subordinate to countries. Most countries contain multiple ethnicities and religions, and most ethnicities and religions are distributed across many

countries. Although each person feels ethnic and religious kinship, they are usually driven by the interests of their country.

The sacred authority of the country began six thousand years ago and has continued to this day. There have been instances where religious power supersedes national power; for example, in Medieval Europe, the Pope held higher power than the secular monarch. However, this was only a brief, transient moment in history, and even then, religious power was used as a tool to achieve state rule. In fact, religion was still subordinate to the state.

We can make one observation: In today's society, countries dominate all the groups, organizations, and individuals subordinate to it. They also deter mine the ultimate role they play in the world according to their own interests.

Two: Competition between Countries

The inherent weakness of human beings often leads to irrational behavior. Individual irrationality, or even irrational behavior of a normal organization, cannot cause much harm. The case is different when it comes to the irrationality of a country. As the highest form of power in the world today, a country can mobilize all its resources when needed, and no other social form can limit its behavior. Therefore, the irrational behavior of a state will be much more devastating than any other social force.

Due to the coexistence of many countries in the world, countries are constantly competing with each other. Such competition is reflected in all aspects of the state, such as politics, economics, military affairs, diplomacy, and culture. Once conflicts from competition intensify to a certain extent, they manifest in the form of war. This has always been the rule of countries.

From the perspective of human nature, competition between countries is usually decided by two factors. The first factor is the eternal competitiveness of humanity itself. The inherent competitiveness of human beings means that all countries will constantly seek to surpass their rivals in all aspects. Smaller countries wish to become larger, and larger countries wish to become superpowers. Though competition between nations involves all aspects of the state, the two main areas of contention are usually the economy and military affairs. As long as these two elements are enhanced, the overall strength of the country will improve. Politics, diplomacy, and culture will improve accordingly. Therefore, all countries give priority to economic and military development.

Military and economic strength are largely decided by a country's land size, population, and resources. For a small country like Singapore, no matter how developed, civilized, and respected it is in the world, it cannot become a major power that dominates world or regional affairs. For a country like India, though it is poor and less developed, its huge land size and population means that it will not be underestimated. It is precisely for this reason that an expansionist mentality will lurk inside all countries. This mentality is closely linked to the country's competitive mentality.

Countries will usually resort to territorial expansion in their bid to surpass their competitors, and territorial expansion can usually only be achieved through war.

The second factor is the extreme selfishness within human nature. Expanding through means of plunder and war is an extremely selfish act. It establishes happiness based on the suffering of others. The casualties in such expansions not only include the people of other countries but also a country's own people; however, a country will never abandon competition due to the immorality of expansion. Extreme selfishness is rooted in human nature, and it makes the expansion of countries unavoidable.

All countries understand the unavoidable nature of expansion and will take precautions to prevent annexation and plunder from invading forces. The most effective way to prevent such invasions is to develop one's own economy and military power. Every country has a sense of crisis and urgency; the coexistence of countries means that not all countries can feel a sense of security. Therefore, the constant need to defend oneself and surpass one's competitors will drive countries into a constant need for further, faster development.

Whenever countries reach a certain level of economic and military development, they will feel constrained by their national limitations. This will drive them to consider expansion. Similarly, countries will also seek to strike first before they themselves become targets of expansion; thus, all countries have the potential to become aggressors and invaders.

To sum up, if proactive competition between countries is caused by the eternal competitiveness of humanity, then humanity's extreme selfishness is what leads countries into passive competition. It does not matter if the com petitions are proactive or passive—they will all inevitably lead to expansion and aggression. In a society comprised of countries, no country can escape the fate of invading others or being invaded. No country exists in a vacuum.

Three: The Double Strengthening of Scientific and Technological Development

Competition among nations will also lead to the emergence of another phenomenon: the country's firm dependence on science and technology. The competition of countries depends mainly on overall strength. The main sustaining point of overall strength lies in economic and military strength; however, military strength needs economic strength as its backing. The improvement of economic strength requires continuous improvements in production efficiency and continuous accumulation of economic wealth. We know that a country's economy mostly relies on enterprises, but the overall development of enterprises decides the overall effectiveness of a country's economy.

Judging from today's situation, globalization is the main trend of the world economy. As the world economy further integrates, this characteristic will only be strengthened. What should countries rely on to remain invincible in the international market? In the long course of human history, mankind has been mostly self-sufficient. Our ability to adapt and transform nature has been very limited. It was not until the Industrial Revolution that people discovered the great power

of science and technology. The steam engine propelled the train beyond the power of thousands of horses. Planes took humans into the sky; televisions and telephones transported images and sounds across tens of thousands of kilometers instantly; the computing speed of one computer soon exceeded that of millions of excellent mathematicians. Science and technology has created unprecedented potential, and people have fully realized its immense ability to create wealth. Science and technology has come to be regarded as the primary force in productivity; therefore, the competition of modern enterprises has become the competition of science and technology.

Since improving the overall efficiency of enterprises means enhancing the economic health of the country, its military budget, as well as overall strength, science and technology has become the core factor affecting national interests.

In fact, the development of science and technology can also directly provide the military with more effective means of war. The emergence of new scientific and technological achievements has always been prioritized for the military and national defense. Therefore, science and technology not only have an indirect effect on the improvement of military strength, but also a direct and important significance. All of this augments the importance of science and technology to national interests.

Since countries and enterprises have similar interests in the development of science and technology, they will mutually reinforce and promote each other in terms of scientific development, forming this logical relationship:

1. Enterprises will only be able to gain substantial economic benefits and remain competitive in the market through scientific and technological research, development, and utilization; therefore, enterprises will be devoted to scientific and technological research.

2. Economic efficiency will lead to corresponding increases in the economic, military, and overall strength of the country. The state can obtain corresponding benefits through the development of science and technology.

3. The state will then support the enterprises' research and development of science and technology with its own resources.

4. The enterprises gaining further economic benefits through scientific and technological innovations enhances the overall strength of the country and gives the country more ability to support and promote further research and development.

This mutually beneficial relationship between the state and the enterprises further promotes the development of science and technology. We will call this relationship the double strengthening of scientific and technological development, or "double strengthening" for short.

Double strengthening is an inevitable phenomenon in our country-based society; it is the inevitable result of competition between coexisting countries. After the Industrial Revolution, this

double strengthening became more obvious and stronger in effect because the great power of science and technology became apparent through the Industrial Revolution. This has led to the consolidation of the double strengthening effect.

Although the main factor for scientific and technological development lies in both the countries and the enterprises, enterprises are still subordinate to countries, leaving the fundamental responsibility with the countries. As supreme powers of the human world, countries have a sacred duty to manage the world in a responsible manner. Any act that goes against the values of mankind should be stopped by the state. This task of preserving human interests cannot be accomplished by enterprises. Enterprises can only be respondents and participants at most— they cannot be the leaders of change.

The competitiveness between countries means that no country can shoulder such responsibility. Science and technology is at the core of economic, military, and overall competitiveness between countries. It determines whether or not a country can hold supreme power in the world. Not only will countries not restrict scientific and technological development, but they will do everything to promote it. The overall threat to mankind cannot undermine the attitude of countries. Human extinction is a future matter for everyone, while any failure in national competition would lead to individual demise. The more immediate and personal matter will obviously win out. All countries must be constantly prepared for war; only by improving their competitive strength can they avoid tragic demise.

Three: Uniting the Human Race

The restriction of scientific and technological development involves many aspects. It is an arduous and long-term goal. Only the utmost commitment from the highest powers of the human race could achieve this goal. The most supreme form of power in human society today is the country; without countries, the move to restrict scientific and technological development is inconceivable.

Countries today put their own interests first and are in constant competition with each other. They are obviously not in a position to lead the charge. What conditions must be met to achieve the goal of scientific and technological development restriction? In order to propel countries into action, there must first be a strong motivational force. The threat to human survival is not strong enough of a motivational force. All countries must receive equal guarantee that their survival and safety will not be threatened due to individual restriction efforts. The rules for restriction must be universal and absolute so that none will benefit from breaking the rules and none will have cause for personal worry.

In order to satisfy these demands, the highest forms of power cannot have divided rule. Whenever power is divided, competition and confrontation will quickly render all efforts useless.

It is logical to conclude that the restriction of scientific and technological development cannot be achieved when the highest powers are divided; the only way to achieve the goal would be through unified global action.

Unified global action refers to the unification of the human race. It requires that the world be unanimously unified and unswerving in its commitment to restrict scientific and technological development. No regional dissent can be allowed. At the same time, the restriction of scientific development has to be long-term and consistent for the future billions of years.

Since countries are the highest forms of human society, the unification of the human race is essentially the uniting of countries. All countries must adhere to the above requirements, and no individual deviation can be per mitted. If any country deviated from the common goal, its impact would be multifaceted. Not only would it cause direct harm through potentially dangerous scientific research, but it would also create a domino effect that would erupt the entire system.

The weakness of humanity ensures that eternal competitiveness, competition, vanity, and aggression will always be a part of human society. If one country opened the dam on scientific and technological development, others would follow suit to avoid being surpassed. The increase in national strength brought on by leading scientific developments would propel a country into a superpower, and it could easily order around and determine the fate of other countries. No leader would allow their competitors to gain such an advantage. Moreover, once a country lifted the restrictions on the development of science and technology, it would achieve high levels of economic development, far surpassing that of other countries. Its citizens' standard of living would be far ahead of the rest of the world, and many attractive technology products would appear. Due to this, people of other countries would demand the same improvements from their own governments, and restrictions on scientific and technological development would be abandoned.

SECTION THREE: THE EFFORTS TO UNITE HUMANITY

Having clarified our attitude towards science and technology and the need to adopt holistic action to strictly limit their development, we should now explore the path to human unity.

In the past, there have been efforts dedicated to exploring and coordinating human actions. These efforts included political, economic, social, environmental, and military developments, but the focus was mainly on the prevention of war. Historically, war has been the clearest and most lethal form of destruction to humanity; however, the situation has changed drastically today. Now the root causes behind the most terrible disasters are science and technology. Not only do they cause mass destruction, but potentially human extinction as well. The development of scientific research and technology should be controlled a hundredfold—or even a thousandfold—more than war.

This matter concerns the overall survival of mankind, which propels it to the highest priority of humanity. This unparalleled importance necessarily requires that the unification of mankind must be absolutely thorough, absolutely consistent, and absolutely persistent. Efforts to unite mankind in the past have been both extensive and vigorous. Among them, the two most effective efforts were the League of Nations and the United Nations.

One: The League of Nations

The League of Nations was the first universal international organization in the history of mankind and the first organized attempt to coordinate world action and safeguard the collective security of humanity. The League of Nations was founded in the early twentieth century after a period of terrible human calamity.

The First World War that broke out in 1914 lasted for more than four years and was the first war on a global scale that involved almost all of the major powers in the world. Over ten million died in the war and more than twenty million were injured. Direct and indirect war costs amounted to 436 billion US dollars—more than ten times the sum of all previous war expenditures of the past two hundred years.

Such huge devastation shocked the world, and fear lingered on long after the end of the war. During the war, some advocated for the establishment of an international organization that would unify and coordinate world affairs and prevent a recurrence of large-scale wars. At the Paris Peace Conference, President Wilson of the United States proposed a fourteen-point plan, in which he devoted the utmost passion and greatest hope to the establishment of an international coalition. In the Treaty of Versailles, the establishment of the League of Nations was listed as the first constituent.

The establishment of the League of Nations was extremely promising to the world. In particular, some smaller countries that were bullied by larger countries saw it as an umbrella to protect their own national security and sovereign equality. Wilson—known as a scholar president—firmly believed that the League of Nations was a “reliable guarantor” of world peace.

After its founding, the League of Nations strived to play an active role in international affairs and carried out a series of tasks following the expectations of the world’s citizens. However, as proven afterwards, the League of Nations did not have the capacity for substantive action, and its effectiveness was extremely limited.

The first serious challenge to the League of Nations was Japan’s aggression against northeast China. On September 18, 1931, the Japanese Kwantung army launched a surprise attack on Shenyang and proceed to occupy the major towns along the Nanman Railway. After the incident, the Chinese government in Nanjing placed great hopes in the League of Nations and expected them to stop such blatant acts of aggression. They decided to hand over complete resolution power to the League of Nations. As a result, the Chinese government filed a petition demanding that the League of Nations take action to rectify the situation.

In response to the Chinese government’s complaint, the League of Nations immediately conducted a study and passed a resolution, but the Japanese government ignored it. Under such circumstances, the League passed the resolution a second time and was opposed by the Japanese again. With no other choice left, the League of Nations decided to form a special team to conduct investigations in the Far East.

After a six-month survey, the team completed the League of Nations Investigation Team Report on the situation in China. After fierce debate, the League of Nations Assembly passed a resolution on the mission's report, renouncing the Japanese army's interference in China. They declared Japan's occupation of Northeast China to be illegal and required immediate withdrawal of Japanese troops. At the same time, they refused to recognize the puppet regime established by Japan; however, they did not impose any sanctions against Japan under the coalition's treaty and admitted Japan's special interests in the northeast. This was actually a resolution that compromised with Japan.

Even such a compromised resolution was met with Japan's firm opposition. The Japanese representative immediately left the assembly, and the Japanese government formally announced its withdrawal from the League of Nations. In the face of Japan's arrogance and dominance, the League of Nations had no alternative but to end the issue with a moral condemnation of Japan.

After the Japanese invasion of Northeast China, the League of Nations was challenged again by Italy's aggression against Abyssinia. On December 5, 1934, on the pretext of a border incident in the Walwal region on the Somali-Abyssinian border, Italy sent troops to occupy Walwal and forced Abyssinia to compensate Italy for its losses. This rude demand was strongly rejected by Abyssinia, but the weaker Abyssinian government knew that it could not defeat Italy on the military front. Its hope was therefore placed in the League of Nations. On January 3, 1935, Abyssinia filed a complaint and requested the League of Nations to intervene to stop Italy's aggression.

At the time, the League of Nations was controlled by Britain and France. Whether for the purpose of upholding the principles of the League of Nations or for safeguarding British interests in North and East Africa, the League of Nations should not have dismissed Italy's aggressive acts. However, the United Kingdom and France were extremely cautious in their treatment of Italy. Their main focus was not on upholding justice and the principles of the League of Nations, but rather on the fear of an Italian-German alliance. Therefore, they adopted an extremely ambiguous attitude to avoid antagonizing Italy.

Britain and France's compromise furthered Italy's aggressive ambition. On October 3, 1935, Italy formally attacked Abyssinia. With such a blatant act of aggression, the League of Nations was forced to react strongly. They declared Italy's action an invasion and decided to impose economic sanctions in retaliation. Unfortunately, due to France's uncooperative attitude, the list of sanctions did not include important products like oil, coal, or steel. A sanction like that was doomed to fail.

In May 1936, Italian troops used chemical poisons to break the stalwart resistance of Abyssinian defenders before capturing its capital, Addis Ababa. Abyssinia was annexed. It is worth pondering that the eminent Abyssinian emperor, Haile Selassie, went to Geneva to speak at a League of Nations conference on June 30, accusing Italy for its crimes of aggression and pleading for assistance. The emperor appealed for a loan from the League of Nations in order to buy weapons to resist the Italian army. This pitiful request met with twenty-three votes of rejection and twenty-five abstentions. The only affirmative vote came from the Abyssinian government itself.

On July 4, the League of Nations concluded its sanctions against Italy; thus, one can see the insignificance of the League of Nations and how vulnerable justice can be in the face of power.

The weakness of the League of Nations, its inability to uphold justice, and its submission to power deeply disappointed the countries of the world. At the same time, it opened the door for fascist aggressions. The League of Nations' weak and incompetent treatment of the Abyssinia issue greatly aroused the aggressive ambitions of the fascists in Germany and Japan. On July 7, 1937, Japan launched an all-out war against China.

Hitler was the ultimate disincentive for the League of Nations. Inspired by Mussolini's successful invasion, Hitler decided to challenge the Treaty of Versailles. Under this treaty, Germany—a defeated nation in World War I—was not allowed to station armies within fifty kilometers of the Rhine's eastern bank. This area was strictly labeled a demilitarized zone.

The presence of the demilitarized zone was a thorn in Hitler's side. It constrained Germany's military expansion and left the west side of Germany defenseless against bordering France. Hitler had wanted to pluck out this thorn since he took office, but Germany was only just beginning to reorganize. Germany could not compete with France and Britain in terms of military strength; it would fail if the international community intervened again; however, the weak actions of the League of Nations, as well as of Britain and France, gave Hitler a spark of hope. On March 7, 1936, he commanded thirty-five thousand German troops to enter the Rhine demilitarized zone and build a military defensive line; they also occupied several important towns along the west bank of the Rhine.

This blatant violation of the Treaty of Versailles put France directly at risk. At the time, the French government advocated sending troops to the Rhineland area and forcing Germany to withdraw its troops. However, Britain, who was unwilling to risk war, opposed France and opposed sanctions against Germany. As the French government did not dare to act alone, the opportunity to enter the Rhineland and stop Hitler's ambitions from further expanding was lost.

The frequent successes of German, Italian, and Japanese fascists made Hitler aware of the League of Nations' vulnerability and insignificance. He quickly realized that there was nothing to fear from the organization. As a result, Germany annexed Austria in March 1938 and again occupied and annexed the Sudeten region of Czechoslovakia in October 1938. Afterwards, it took the opportunity to loot and destroy Czechoslovakia.

On September 1, 1939, Hitler's Germany publicly broke the German Soviet Pact and attacked the sovereign state of Poland. On September 3, Britain and France were forced to declare war on Germany, and World War II finally broke out. After the outbreak of World War II, the League of Nations existed in name only. It officially announced its dissolution after WWII.

Peace lovers, political leaders, and scholars alike devoted great enthusiasm and effort to the League of Nations, from its preparation to its establishment. People imagined that the establishment of an international coalition would bring lasting peace to the world; however, this

was only a short-lived illusion. In the twenty-six years of its existence, the League of Nations did not stop any major wars.

Another important task undertaken by the League of Nations was the organization and coordination of international disarmament. In this arena as well, the League of Nations did not achieve any substantive disarmament progress. In fact, it only ever managed to provide unrealistic hope to the people and some reference for the establishment of the United Nations in the future.

Two: The United Nations

Humans never learn from past mistakes. We pray for peace, but peace is often easily shattered. The Second World War broke out only twenty years after the first and on an even more devastating scale. World War II resulted in one hundred million casualties, of which more than fifty-five million were deaths. The economic loss caused by the war cannot be accurately calculated.

Having personally experienced the great catastrophe of two world wars, people desired peace even more and hoped for an institution that could truly control the world and ensure peace. The United Nations was born as the result of this desire.

1. Inability to Maintain World Peace

The United Nations was founded more than seventy years ago. Maintaining world peace and building a collective security system were the main purposes and original intentions of the United Nations. During this time, although a third World War has not occurred, localized wars has never stopped. Armed conflicts of varying scales have been taking place constantly. The death toll from these wars and armed conflicts has totaled nearly thirty million, three times that of World War I. Bigger conflicts have broken out more than two hundred times. Some of them were very large in scale and involved many countries, such as the Korean War, the Vietnam War, the war in the Middle East, the Iran-Iraq War, the Gulf War, the Iraq War, the Syrian War, and others. Though the United Nations has tried its best, it is often powerless to safeguard world peace and resolve local conflicts.

Varying national interests is the fundamental factor that affects the United Nations' peacekeeping efforts. As an international organization, the authority of the United Nations is bestowed by the states; thus, the interests of sovereign states precede the interests of the United Nations. The decisions of the United Nations can be rejected by countries when they conflict with national interests, and they are largely influenced by the major powers of the world. Therefore, most United Nations decisions are only likely to be implemented when they are in line with the interests of the major powers.

During the forty-year period between the June 1948 war in the Middle East and the end of the Cold War in 1988, only thirteen peacekeeping operations were conducted by the United Nations. However, since 1989, there have been peacekeeping operations every year ... sometimes with

more than ten in a year. The differing camps of the Cold War era made it very difficult for the Security Council to reach an agreement on peacekeeping operations. Since the end of the Cold War and the disintegration of the Soviet Union, the conflicts among the major powers have eased and the competition among countries has shifted to economic and social development. All countries want a peaceful and stable international environment to ensure development; therefore, peacekeeping efforts have progressed.

A new world order formed after the Cold War, and the United States has emerged as the undeniable superpower. As the only superpower in the world, the United States has habitually influenced the United Nations' decisions and facilitated its own expansion in the name of peace and anti-terrorism. The United Nations does not always heed the United States' demands, but whenever this happens, the United States pushes aside the UN and acts alone outside UN jurisdiction.

In 2003, the United States planned to overthrow the Iraqi Saddam regime under the pretext of fighting terrorism. The entire world was well aware that the United States' so-called anti-terrorism campaign was nothing but nomenclature. Promoting its own hegemony and acquiring oil rights in the Middle East was the real motive. Most countries firmly boycotted the actions of the United States. Massive protests and demonstrations around the world highlighted common spontaneous actions that had not been seen since the Cold War. Even major US allies like France and Germany expressed their firm opposition. The United States tried to obtain authorization from the Security Council, but apart from themselves and Britain, the other three permanent members vetoed the motion. Under these circumstances, a handful of countries, including the United States and Britain, bypassed the United Nations and unilaterally attacked Iraq to overthrow the Saddam regime.

Such disregard of unanimous international opposition and the bypassing of UN decisions has not been uncommon during the United Nations' seventy-year tenure. The UN passed several resolutions denouncing the blatant Israeli occupation of Arab territories and its suppression of the founding of Palestine; however, Israel repeatedly ignored these resolutions due to strong backing from the United States. North Korea relies on its special relations with China and Russia to repeatedly bypass the United Nations as well. The United Nations has no alternative but to turn a blind eye to North Korea's frequent testing of nuclear weapons and ballistic missiles. When it comes to actions involving direct participation of major powers, the United Nations is even more helpless and sometimes cannot even verbally protest. Examples include the Warsaw Pact invasion of Czechoslovakia, the Soviet invasion of Afghanistan, the NATO war on the Federal Republic of Yugoslavia, the United States' invasion of Grenada, the United States' invasion of Panama, and so on. As for the two largest wars since World War II—the Korean War and the Vietnam War—the United Nations was powerless to settle any disputes, since both wars were backed by major powers.

2. The Difficult Road to Disarmament

The UN Charter states that the United Nations will work to minimize the consumption of the world's human and economic resources by armaments and that the UN General Assembly and

Security Council are responsible for disarmament efforts. In order to promote disarmament, the United Nations has set up a series of disarmament negotiation organizations. On January 24, 1946, the UN established the Atomic Energy Commission under the UN Security Council. This was the UN's first disarmament organization; however, the United Nations' disarmament efforts over the past seventy years have been almost laughable.

In 1961, the Soviet Union planned to test a hydrogen bomb that would produce energy equivalent to fifty-six million tons of TNT in Novaya Zemlya. Such a huge explosion would be nearly three thousand times more destructive than the atomic bomb explosion in Hiroshima, and it was extremely incompatible with the world's desire for nuclear disarmament. Therefore, on October 27, the UN General Assembly adopted a resolution that required the Soviet Union to stop the nuclear test with eighty-seven votes in favor, eleven votes against, and one abstention. Three days later, the Soviet Union conducted the test as scheduled, despite the unanimous opposition of the international community.

The Comprehensive Nuclear-Test-Ban Treaty requires the signature of forty-four nuclear-capable countries and the approval of relevant authorities in those countries. So far, a number of nuclear-capable countries have not signed and ratified the treaty. In particular, the largest nuclear-armed country in the world—the United States—has not ratified the treaty through its congress. The UN has no power to enforce the actions of such powerful countries.

In 1967, the United States adopted the Outer Space Treaty, forbidding the deployment and use of weapons of mass destruction in outer space and prohibiting the establishment of military bases on alien planets. However, both the United States and Russia have officially launched "Space Force" projects, and Russia has officially named its aerospace force the "Space Force."

The United States' withdrawal from the Anti-Ballistic Missile Treaty was especially regrettable. The ABM Treaty was signed by the United States and the Soviet Union in 1972 to ensure mutual nuclear deterrence by forbidding the development of a national anti-ballistic missile system on both sides. It aimed to control the "nuclear terror balance" to contain potential nuclear war. After the Cold War, the balance of power between the United States and Russia shifted. The United States became bent on becoming a military leader and dominating the world, and the world was aware that the United States might decide to unilaterally withdraw from the ABM Treaty. As a precautionary measure, the fifty-sixth session of the UN General Assembly passed the resolution to "safeguard and observe the ABM Treaty" by an overwhelming majority of eighty-two votes in favor and five against on November 29, 2001. The UN General Assembly had passed three similar resolutions in a row; however, on December 13, 2001, the US president announced withdrawal from the ABM Treaty despite strong opposition from the international community.

The ABM Treaty was a cornerstone of the international arms control system. More than thirty international disarmament treaties were linked to it. The abolition of this treaty shook the international disarmament system, and the consequences can only be imagined.

When the UN started to devote itself to international nuclear disarmament in 1946, only the United States had atomic bombs; however, an increasing number of countries have come to own nuclear weapons despite international disarmament efforts, and nuclear weapons have increased in variety and number. The number of countries that have openly admitted to nuclear weapon possession has reached nine so far, but the actual number is likely even higher. The world's nuclear arsenal reached a maximum of seventy thousand warheads at one point, and even existing nuclear warheads total about ten thousand. In addition to atomic bombs, nuclear weapons have also developed to include hydrogen bombs, neutron bombs, and shock wave nuclear bombs. Fourth generation nuclear weapons are also being secretly researched by major countries.

After the Cold War, the United Nations adopted many resolutions regarding disarmament; however, the minimally restrained United States has been marginalizing the United Nations. Few resolutions can have any substantive restriction on a major power like the United States ... or any major powers at all.

3. Coordinating the Dilemma Between Economic and Social Conflicts

Unlike the League of Nations, the United Nations is also tasked with coordinating international economic, social, cultural, educational, and health work. Compared to the maintenance of world peace and international dis armament, it is much easier for the United Nations to adopt declarations, conventions, treaties, and resolutions in these areas. These issues concern general morality and universal common interests; however, the number of resolutions from the United Nations must be greatly reduced if they are to be implemented. Resolutions with universal common interests are easily implemented, but resolutions of a moral nature must contend with varying national interests. When long-term interests conflict with short-term interests, or national interests conflict with global interests, resolutions become difficult to implement, and countries often withdraw their support.

Relative to war and disarmament issues, economic and social issues are less urgent and less focused upon. As a result, the world has less supervision over economic and social resolutions adopted by the United Nations. The prevailing non-implementation of such resolutions has not drawn the attention of most people in the world.

From August 27 to September 7, 1990, the Eighth UN Congress on the Prevention of Crime and the Treatment of Offenders was held in Havana, Cuba. In only ten days, forty-six resolutions were passed—a record that would never have been achieved if war and disarmament issues were being discussed. Crime prevention is a matter of concern to all countries, and not much opposition exists, but the treatment of criminals is a generally accepted moral issue. Even if some countries did not intend to improve their treatment of criminals, they would not voice such views publicly.

Drug abuse and drug trafficking are universal problems for humanity as well, and the concept of drug control generally receives worldwide acceptance. The United Nations adopted the Single Convention on Narcotic Drugs and UN Convention against Illicit Traffic in Narcotic Drugs and

Psychotropic Substances without much resistance. Similarly, the more than one hundred anti-drug motions formulated by the United Nations were also relatively easy to carry out.

Terrorism is also a big threat to humanity, so resolutions like the Convention on the Prevention and Punishment of Crimes against Internationally Protected Persons, Including Diplomatic Agents and the International Convention Against the Taking of Hostages received minimal protest.

Environment and resource problems are major issues that concern the sustainability of humankind. Under the United Nations, two hundred conventions, agreements, and treaties relating to environmental and resource issues have been adopted and signed around the world; however, such conventions, agreements, and treaties are much more difficult to implement. For example, after many years of difficult multilateral negotiations, more than one hundred countries witnessed the signing of the Paris Climate Change Agreement on reducing greenhouse gas emissions. As the world's largest emitter of greenhouse gases, the United States also signed this agreement. Unfortunately, on June 1, 2017, the new US president, Donald Trump, announced his withdrawal from the agreement out of consideration for the US economy.

The protection of forests is an important step in the protection of biodiversity, the prevention of desertification, and the control of global warming. In September 1991, the United Nations adopted the Paris Declaration and appealed to the world for better protection of forests and the rebuilding of green vegetation on Earth. Later, The Forest Principles, the Convention on Biological Diversity Protection, and the UN Convention to Combat Desertification were adopted. However, poorer, developing countries ignored these conventions to boost their productivity through industrial development and development of science and technology. In order to survive, they deforested, sold their resources, overgrazed, and over-cultivated to obtain basic food and clothing.

We can see that it is not so easy for the United Nations to pass the above mentioned resolutions, and it is even harder to solve such problems fundamentally. The reason for this lies in the contradiction between the restrictions contained in these resolutions and the interests of some countries. When there are contradictions between short-term interests and long-term interests, countries generally choose short-term interests. When national interests conflict with global interests, countries inevitably choose the former.

SECTION FOUR: THE FUNDAMENTAL CHOICE—BUILDING A UNIFIED SOCIETY

The two greatest efforts to unite mankind—the League of Nations and the United Nations— have both failed in practice. What led to this failure? What measures can be taken to truly achieve the goal of uniting humanity and thus ultimately realize the restriction of scientific and technological development?

One: The Root Cause that Limits the Effect of International Organizations

1. Conflict between the Interests of Nations and the Interests of International Organizations

The League of Nations and the United Nations were both born out of World Wars. They were the results of deep reflection in the aftermath of bloody casualties. Such international organizations were established based on the goals of ending war, reducing armaments, safeguarding peace, eradicating poverty, and benefiting the world by coordinating and unifying human actions. In practice, however, the League of Nations did not stop the outbreak of World War II, and the United Nations did not stop the hundreds of major local wars that took place after World War II. Neither organization managed to decrease the large reserve of nuclear warheads or the constant destruction of the environment. The problem of poverty also remains severe.

It should be said that international organizations are neither blind nor careless to all these issues. On the contrary, international organizations are dedicated to the preservation of overall human interests in all matters that seriously concern humanity. International organizations have made much effort and done all they can; unfortunately, they do not have much to show for it.

The first obstacle that stands in the way of international organizations' efforts to unite humanity is the conflict between the interests of countries and the interests of international organizations. At the root, international organizations are comprised of countries, and they are established and promoted through the efforts of national leaders. The sponsors of international organizations are usually the most influential and authoritative country leaders; therefore, there should be no major conflicts of interest between countries and international organizations. However, that is not the case. The interests of countries and the interests of international organizations collide frequently, which usually makes it difficult for international organizations to achieve their intended goals.

At the root, it is the human inclination for visible interests that causes the contradiction between the interests of countries and the interests of international organizations. The weakness of human nature determines that local interests often prevail when they conflict with global interests. When immediate interests conflict with long-term interests, immediate benefits tend to win out. When surface interests conflict with fundamental interests, it is often surface interests that are chosen. This is the essence of human nature.

In general, international organizations represent the overall, long-term, and fundamental interests of mankind, since they are established to preserve the future of all humans. Both the League of Nations and the United Nations were established in view of the enormous casualties caused by the World Wars. They were meant to protect humanity from any further suffering. These international organizations were not formed to represent local interests, but rather the overall, long-term, and fundamental interests of all mankind.

The League of Nation's main purpose and responsibility at that time was to stop war and reduce armaments. Its focus was undoubtedly on the overall interests of mankind rather than the local interests—the long-term and the fundamental interest rather than the immediate and surface benefits. In terms of commitment and scope of responsibilities, the United Nations has a broader purpose than the League of Nations. In addition to safeguarding world peace and reducing global armaments, the United Nations has social, economic, and cultural responsibilities as well. To this end, the United Nations is committed to poverty eradication, environmental protection, and the

crackdown on drugs and international crime, all of which are issues of overall, long-term, and fundamental importance.

Not all actions of international organizations benefit the overall, long-term, and fundamental interests of mankind. For example, the United Nations does not advocate the restriction of scientific and technological development, but rather encourages it. This only means that the UN has not yet realized the enormous threat science and technology poses to humanity as a whole, not that they do not care about human survival. In another example, there have been some incidents in the history of the United Nations where major powers have been allowed to pervert social morality; however, this was because the United Nations was powerless to stop such aggression.

On the contrary, countries are usually only concerned with their own interests, the interests of the present generation, and the happiness and survival of their own people. The interests they represent are localized, immediate, and surface-level, because the country itself is a localized and regional concept. Countries must first consider the governance of their own regions and the interests of their state before the interests of the world.

We know that eternal competitiveness is an inherent weakness of humanity. Such competitiveness will also manifest between coexisting countries. Countries will compete with each other in terms of overall strength, citizen living standards, strength of national leaders, and other qualities. There will always be countries that put their own interests ahead of the overall interests of mankind. These actions will not only disrupt the hard work of other countries, but they will also bring them corresponding individualized interests, propelling them forward in terms of national strength. When their strength reaches a certain level, they will be able to oppress weaker countries, putting those countries that have prioritized the overall interests of mankind at a disadvantage. This disadvantage is not a disadvantage in the general sense. The oppression of a weaker country often comes at the expense of total demise or millions of casualties.

Similarly, there will always be some countries that blindly guarantee the interests of the present generation over the interests of future generations so as to enhance contemporary standards of living. The happiness of the current generation is closely tied to the rule of existing governments; thus, rulers will usually choose to satisfy the generation at hand.

When it comes to matters of fundamental interests, we know that the issue of overall human survival is often not an urgent issue. Contrarily, it usually takes some reflection and intelligent thought, and it is mostly focused on the future. Countries will always be pressured to develop faster for competitive advantage and to ensure the immediate demands of their people. In light of this, the fundamental overall situation of mankind is difficult to account for. After all, the survival of mankind is a future matter for everyone, while the interests of countries are much more personal and immediate.

To sum up, it can be clearly seen that localized, immediate, and surface interests often conflict with overall, long-term, and fundamental interests. In a society where countries represent the former and international organizations represent the latter, conflicts between the two cannot be

avoided. As long as countries and international organizations coexist, conflicts between the two will not cease.

2. International Organizations Are Powerless to Restrain the Behavior of Countries

International organizations are established by and comprised of countries. Their power is given by countries; however, international organizations rarely receive state support when they exercise their powers. In fact, countries are usually the biggest obstacles to the efforts of international organizations.

In July 2004, China Central Television interviewed former UN Secretary-General Ghali. When talking about the massacre in Rwanda, Ghali said that he had asked more than forty countries to send troops after realizing the seriousness of the situation. Sadly, no country agreed to dispatch troops. As a result, nearly one million people died in less than one hundred days. No country wants to lose their own troops to peacekeeping efforts, nor do they want to pay for such operations. The United Nations does not have an army of its own. Secretary-Generals like Ghali can only ask other countries for troops, weapons, and money. Ghali commented that UN Secretary-Generals act as secretaries for the world's major powers but are also expected to behave like generals during times of crisis. Countries generally only like the secretary—not the general.

In October 2004, when interviewed by China Central Television, UN Secretary-General Kofi Annan—who was still in office at that time—said almost exactly the same thing. The words of both Ghali and Annan fully illustrate the awkward position of the United Nations.

The idea of people's sovereignty is a commonly accepted political idea in contemporary democracies. According to this theory, state power is granted by the people, and the relationship between nations and their citizens is similar to the relationship between international organizations and nations. However, countries can restrain the behavior of their citizens through laws. Citizens must live, study, and work within the permitted scope of the country. In sharp contrast, the powers of international organizations are also given by countries; the constitutions of international organizations are signed by and legally bind all member states.

Countries often violate the rules and regulations of international law, yet they rarely receive any substantive penalty because they possess means like military, police, and courts to safeguard their regime, exercise their sovereignty, and mobilize their economic and social resources. International organizations do not have such means or capabilities; they are only able to exercise their functions through the power of the states. If countries are willing, they will lend their power. If countries are unwilling, and especially if they are strong enough, they can function free of restraint from international organizations.

It is the supreme authority of countries that allows them to hinder the decisions of international organizations; as such, international organizations are often unable to control the actions of countries. At the same time, countries all have their own varied interests. Conflicts will occur

when each country is taking care of their individual interests independent of one another. As a lesser form of power, international organizations cannot unite the interests of all countries—at best, they can only try to coordinate. These coordination efforts depend entirely on the attitude of countries. When the interests of major powers converge, better results will be achieved; when interests contradict, the outcome is much worse.

We know that the restriction of scientific and technological development will inevitably touch on the interests of countries. National strength, the efficiency of enterprises, and the standard of living are all linked to science and technology, making any restriction a serious challenge to national interests. Only an extremely powerful global unification body could achieve successful scientific and technological restriction and preserve the overall, long-term, and fundamental interests of humanity. International organizations cannot fill this role, as they will always be overridden by the power of sovereign states.

Two: Only a World Power Could Unite Mankind

1. A World Power and a Unified Society

International organizations cannot be depended on to lead the unprecedented initiative of restricting scientific and technological development—neither can states. There are about two hundred countries in the world today, and it is precisely their vicious competition that has led to the rapid development of science and technology. The three increases pattern is an inevitable result of our country-based society. In fact, only by eliminating the fragmented actions of countries and unifying all humanity can we avoid disorderly competition and limit the development of science and technology.

What kind of organization, or what form of organization, can accomplish such an arduous and sacred mission? In the ten thousand years since mankind entered the civilized age, various forms of organizations have existed. The most systematic and effective organization has been the country. In theory, state power belongs to the people in modern democracies; however, states rule the people through various political institutions, like the military, the police, and the judiciary system. Under state governance, all persons must act according to law and will receive corresponding punishment otherwise.

Countries possess numerous ways to cement their rule, such as economic means, administrative means, military means, propaganda and public opinion means, and legal means. Countries have remained enduring and vital social forms due to these effective social management methods; however, countries only enjoy powerful governance and effective management within the scope of their own rule. Once they leave this scope, they will have to abide by the rules and management of other countries.

We can see that all countries have formed their own highly independent regions. These regions form the boundaries of all countries. Within the boundaries of each country exist independent

governments and interests. Countries have absolute control within their own regimes, and no other forces can disrupt this control.

In order to control the world and unify the actions of all mankind, it is necessary to establish an institution as effective as countries in terms of rule and management, but this institution's rule would not be merely regional—it would extend to the entire world. We can call this institution a world power.

This so-called world power would establish a global, unified regime and achieve the unification of all mankind. All human beings would be under the rule of this regime. This world power would have the authority and strength of countries expanded to encompass the whole range of mankind. It would replace countries to become the supreme governing body of human society. This supreme body of power would be totally unique. Not only would it govern all mankind, but it would also consider the overall, long-term, and fundamental interests of all mankind. Only a world power could achieve the successful restriction of scientific and technological development on a global scale.

The establishment of a world power would require the eradication of sovereign states. It would achieve governance on a global scale, and the social form of humanity would be transformed from a national one to a universal one. The world government would be the supreme administrative authority in a world-power based society. It would examine issues from a global perspective and take actions to preserve the long-term and fundamental interests of all mankind. To achieve this, it would coordinate the allocation of global resources and formulate administrative rules and regulations for the world.

In addition to an administrative power like the world government, a unified society would also have a unified legislative body and a unified judicial body. Everyone in the world would study, work, and live under the unified legal framework, and everyone would have corresponding obligations and responsibilities.

The world government, the world legislative branch, and the world judiciary system would constitute the major components of the world power. The world's regime would be subdivided into many other departments of power, such as military, police, inspectorate, economic management, cultural administration and social administration.

2. A Unified Society Is Not a Deliberate Utopia

Historically, many thinkers have envisioned an ideal society. In The Republic, Plato spoke about public property, the emancipation of women and the emphasis on education. In Utopia, Thomas More also describes the idea of public property and female emancipation; however, while Plato advocated public ownership of property at the elite level, More advocated for public property in the whole of society. More also believed in monogamy and letting everyone work to earn their own living.

Chinese Confucianism also envisioned an ideal commonwealth society practicing public ownership of property. It advocated meritocracy and a harmonious, honest, and trustworthy coexistence of peoples. Many other well-known thinkers described similar visions of ideal societies, including Aristotle, Campanella, and Marx.

In The City of God, Augustine elaborates that the ideal nation should first be a Christian nation. This is a description of the ideal society from another perspective. Many people hold such a view, and most of the medieval scholastics subscribed to it.

Modern thinkers rely more on political theory and hope to achieve a perfect nation by changing a country's political and state systems. A group of Enlightenment thinkers, like Hobbes and Rousseau, put forward the doctrine of popular sovereignty and believed that the sovereignty of the country belonged among the people. In order to realize people's democracy in a large country and enable everyone to exercise their full powers, Paine and Mill proposed the idea of a representative government. In order to prevent dictatorship, Locke and Montesquieu and other thinkers put forward the idea to decentralize state power to balance power with power.

The above ideas are all deliberate designs for ideal societies based on ideas of "justice," "goodness," "happiness," and "power." They are societies meant to achieve the most suitable political circumstances and standards established by various thinkers. Perhaps these societies are simply impossible "utopian" fantasies, but they are theoretically consistent with some political principles.

Similar ideas have been proposed regarding the unification of the world; 2,300 years ago, the founder of the Stoic school, Zeno, proposed the concept of a "world state." He believed that human rationality was unified and universal; therefore, all people were citizens of the world living by a common nature. He believed that there should be no distinction of race, status, or region. There should be only one kind of citizen in the world—namely, citizens of the world—and only one country should exist in the world: a country of the world.

Marx and Engels also discussed the issue of world unification. In their view, a communist society was the inevitable fate of human social development, but communist countries would gradually die out. The precondition for the demise of communist countries would be the eradication of class. Therefore, it would take a long time to realize country demise and world unification.

Many other historians have put forward the idea of world unification. For example, Kant thought of "world citizens" and Kang YouWei thought of "a world of common people." Zeno, Marx, Engels, Kant, and Kang YouWei, all envisioned world unification from the perspective of an ideal society.

The unified society we speak of here is completely different. Our intention is not to create an ideal society. The need for world unity is simply because humans will face extinction otherwise. Only the unification of human society and the establishment of a world power can ensure the survival of mankind as a whole. Only a world power can truly unify human actions, limit the development of

science and technology, and prevent the extinction of mankind by science and technology. In other words, a unified society is merely the only option we are left with.

Nonetheless, the human pursuit of ideal societies will always exist. Establishing a world power and realizing the unification of society does not rule out such hopes but is instead a step in the right direction. We must continue our efforts in this direction; if we stray from the path of world power, mankind will move towards extinction.

Numerous elements are involved in human society. We propose the concept of a unified society as an overall summary of the social forms of mankind under the future world power. In reality, the unified human society will include political, economic, social, cultural, and ideological aspects. Different designs and combinations of these various elements will have a direct impact on the realization of human values. We not sidestep the pursuit of an ideal society; on the contrary, we should seriously design and implement the overall interests of mankind to achieve the most ideal society possible. Only in this way can we truly adopt a universal standpoint and a responsible attitude towards all mankind.

Chapter Nine Human Unification is Already Possible

After concluding that the unification of society is the only option for the salvation of mankind, we must first consider whether it is possible to achieve something so unprecedented. Specifically, this possibility includes two main aspects: First, we must determine whether or not a large unified society can carry out effective governance. If effective governance cannot be implemented, the idea of establishing a unified society is purely theoretical. Secondly, we must examine the difficulty of realizing human society unification. That is, in terms of today's situation, what are the favorable conditions and unfavorable factors that will ultimately affect our move towards unity?

SECTION ONE: THE GOVERNABILITY OF A UNIFIED HUMAN SOCIETY

We have learned from experience that transportation and communication are the first conditions for successful governance of a large nation. It is impossible to achieve effective rule without convenient transportation and communication.

The larger the territory and the population, the more complicated various unidentifiable political, economic, social, military, and natural elements will be. If it takes three or four months for news of a natural disaster in a remote area to travel to the governing center, effective measures will not be taken in time. If any major policy or action took one or two years to communicate and implement over the entire regime, it would become outdated before going into effect.

The world power in a unified society would have to deal with all human affairs, from the Antarctica to the Arctic, from the Eastern Hemisphere to the Western Hemisphere. Unexpected events would happen every day. The world power would have to send out policies and instructions every day. Without convenient transportation and fast communication, effective management would be impossible. Therefore, communication and transportation capabilities hold veto power when it comes to the establishment of a unified society.

The governance of a unified society includes many factors, such as the feasibility of various political, economic, cultural, and social issues; issues of religious inclusion, ethnic integration, language, and written word exchange; and matters of transportation, communications, media, and others forms of information dissemination. Factors like religion, ethnicity, language, and the written word can be solved through human actions; thus, we call these "soft conditions." Technical conditions like transportation, communications, and media are limited by the levels of science and technology in various periods; they can only be dealt with by existing means. Since the unified society is dedicated to the restriction of scientific and technological development, such technical conditions cannot be changed, only adapted. Therefore, these conditions are "hard conditions"; we can also call them "hard technical conditions," or "technical conditions" for short. Since soft conditions can be changed and hard conditions cannot, governability of a unified society depends entirely on the hard conditions of that time—that is, whether the technical conditions can meet the requirements of global governance. The main requirement for successful global governance is the smooth delivery of government decrees.

One: Smooth Delivery of Government Decrees

Broadly speaking, the smooth flow of government decrees in a unified society consists of two aspects. First, the law must be upheld across the globe and in all areas of humanity, and the world power, as well as all levels of local government, must be produced in a legitimate process. This "law" refers to the unified law of a unified society, and it should be based on legitimate procedures. It should cover the whole of mankind—each individual, every group, all organizations, and all institutions. Second, all decisions and actions taken by the world power must be within the scope of law authorized by the unified society and all levels of local governments. These actions should be necessary, prompt, and effective. They should also receive timely feedback.

In order to study the smooth delivery of government decrees, we must first understand the methods and procedures of governance. Generally speaking, they can be broken down into the following aspects:

1. The Birth of Governance

The key to the governance formation of a large unified society is the birth of the world power. Only the creation and successful operation of a world power can ensure smooth, successful local governance. According to the commonly used forms of political power in human society today, the emergence of a world power consists of two key parts: the emergence of a world government leader, and the emergence of world parliament members.

Just from a technical perspective, democratically electing government leaders and politicians is the most difficult way to form a world power. In order to produce these people in a truly democratic manner, all electoral candidates will need to be known to all global voters. Voters will have to understand not only their political opinions, but also their moral character, ability to govern, language expression, demeanor, and so on. With such a massive area and a large population, the technical conditions to truly achieve democracy would be the prompt, expeditious, and vivid reflection of each participating candidate to each and every elector. At the same time, voters would need to be able to select their satisfactory candidates conveniently and accurately, conveying their votes in a timely and accurate manner to generate election results efficiently. The above conditions dictate that democratic governmental elections will require much more complex technical conditions than non-democratic government appointments. Non-democratic government appointments need only be discussed in a small area, and the designation of individuals can produce successors to power. Such a procedure requires less complex technical conditions.

2. Communicating Political Situations

Communicating political situations refers to the prompt communication of all major issues in the world that are related to the survival, work, and education of the people to the local government departments at all levels through various channels. Based on the importance or scope of these situations, local authorities will then promptly report to the top-level government authority (i.e. the departments of the world government).

3. Relaying Government Decrees

Based on the political situations reported by various region, the relevant departments of the world power will formulate various policy measures and decide on actions to take within the scope permitted by law. Some of these policies and actions may need to be implemented globally, while others may need to be implemented by groups. Some policies and actions may require implementation by the different levels of government agencies, while others may need direct operation and implementation by the world power itself. At the same time, new decrees may be improvements or new demands on preexisting laws and regulations. In any case, these decrees must first and foremost be communicated immediately to every officer who will fulfill them. In the face of natural disasters, manufactured disasters, and social unrest, it is especially important for decrees to be issued immediately to those concerned.

4. Execution of Decrees

Once decrees are successfully relayed, they must be executed. A world power that governs global affairs will most likely issue decrees of strong principle that will require disassembly by all levels of government authorities before being passed down. Specific implementation and operation of such decrees must also be discussed between the levels of local governments. In either case, the treatment of such decrees must be comprehensive, truthful, timely, and uncompromising. If each level of the government allows some small room for compromise while carrying out a world power decree, the decree will change drastically by the time it is implemented on the final scale. Due to the scope of the unified society, it will require more accurate, effective, and timely implementation of government decrees.

5. Supervision of Decrees

The supervision of decrees refers to the supervision and examination of government decrees. It requires that any deviations and out-of-date situations be promptly corrected, and that those who have performed well be awarded and encouraged accordingly. At the same time, supervision of the decree should also amend the decrees by looking at the practicality and accuracy of the decrees.

Two: Modern Means of Exercising Government Decrees

Modern means of exercising government decrees have developed exponentially. The fruits of the Industrial Revolution have allowed such means to make a qualitative leap in the past 200 years. These means can be broadly classified into three categories: communication, transportation and media.

1. Means of Communication

The discovery of electromagnetic induction provided a theoretical basis for the widespread application of electricity, including electricity in the field of communications. The earliest

application of electricity to telecommunications was cable and then radiotelegraphy. However, the advent of a series of new means of communication has basically phased out telegraph services.

The phone is a vital contender. Telephone communication is very direct and produces a strong sense of realism and intimacy. After the landline was invented, scientists invented wireless phones. With artificial satellites in space, it is now possible for wireless phones to communicate globally in any environment, with little or no geographical constraints. Due to their convenience, speed, and low cost, personal mobile phones have developed rapidly and become universally popular in recent years.

Another development in telephone technology is optical fiber communication. Optical fiber communication can replace high-frequency microwaves with light as a medium and replace cables with optical fibers. It allows for greater capacity, higher quality, and lower cost phone calls.

Video telephones are another form of the telephone. They convey both voice and video across great distances. As long as there is a market demand, further cost reductions will allow for widespread use of videophones.

Faxing is another means of communication that is tied to the telephone, which allows the fax machine to convey everything on paper from one place to another, including text and pictures. The combination of telefax and satellite communications now allows for instant reception of messages and faxes using mobile phones, and laptops have become commonplace as well. The Modern communications industry has undergone tremendous change compared to its state before the Industrial Revolution.

In recent years, the emergence of the internet has revolutionized communication technology. This includes both the computer internet and the smartphone-based mobile internet. At present, the number of internet users in the world has reached billions and is widespread.

Multimedia communication on the internet can provide sound, video, picture, figures, data, and text. It is a product of the combination of communication technology and computer technology. Users have full interactive control in this type of communication. On the internet, friends can chat face-to-face across the ocean; colleagues from multiple locations around the world can conduct meetings to discuss issues; trade negotiations with distant clients is possible, and product samples as well as contracts can be demonstrated immediately during such negotiations.

Through the internet, computer hardware and software resources can be shared; real-time transactions can be conducted on stock markets and foreign exchange markets; E-mails can be sent to multiple recipients at the same time (these e-mails include texts, pictures, videos, and sounds); instant news and other kinds of information can be read; entertainment is readily available; virtual companies, virtual schools, virtual cities, and even virtual countries have appeared on the internet as well. The internet is bringing the world into a new information era.

2. Means of Transportation

Although horses and wagons as well as non-motorized vessels are still used as ancient means of transportation, modern means of transport have fundamentally changed the way people travel. The fruits of the Industrial Revolution have not only created new land and water transport methods, but have brought humans into the sea, sky, and space.

Once the steam engine was invented, people wanted to apply it to land transportation to replace traditional carriages and ox carts. The earliest application was the train. Within two hundred years, the train progressed from steam locomotives and diesel locomotives to electric locomotives. With each passing year, train locomotive power is increasing, speed is accelerating, and pollution and noise are decreasing.

In 1964, Japan built the world's first high-speed railway: the Tōkaidō Shinkansen from Tokyo to Osaka. High-speed trains can reach a speed of 210 kilometers per hour. After Japan accomplished this, France, Britain, Germany, and China also built their own high-speed railways. In addition to these nations, Italy, Belgium, Russia, Sweden, and other countries have built operating high-speed trains as well. The high-speed train "Eurostar," which runs through the Channel Tunnel, links London, Paris, and Brussels. China's high-speed trains run through all provincial capitals except Tibet and generally exceed three kilometers per hour in speed.

After the invention of the steam engine, people began to make efforts to use steam engines for water transport as well. In 1907, the first steamboat was successfully manufactured. Today, the internal combustion engine has replaced the steam engine as the source of power for ship transport. As a result, the largest ships can carry six hundred thousand tons of payload. Ordinary passenger and cargo ships have a maximum speed of over thirty nautical miles per hour, while special ships travel even faster. The speedboats used by public security officers can reach eighty to ninety knots.

Nuclear-powered ships have also been invented, but nuclear power is mainly used for aircraft carriers and submarines. Today's submarines can submerge hundreds of meters underwater and can stay days in deep sea. Unfortunately, these submarines are usually developed as weapons of war. Submarines used for scientific research can dive into sea trenches several kilometers deep.

Today, the most widely used alternative to wagons as a means of land transport is the car. The car has far exceeded the carriage in terms of loadcapacity, speed, comfort, and durability. We can see all kinds of cars everywhere in the world, as well as highways extending in all directions—especially in developed countries.

The birth of the aircraft brought mankind into a whole new era. The earliest use of the aircraft for civilian transport was in 1918, when regular postal flights were opened between Paris and London, and between New York–Washington–Chicago. Today's airplanes are an indispensable means of global transportation; however, they are also indispensable tools of war.

Aircrafts have been constantly developing and increasing in speed, and today they can travel more than three thousand kilometers per hour. The ordinary subsonic aircrafts we usually ride on can

reach a speed of one thousand kilometers an hour. Subsonic aircrafts are also capable of flying long distances; for example, the Boeing 747-400 can travel thirteen thousand kilometers without refueling. The Airbus A380 can carry up to eight hundred passengers and travel a maximum range of 15,100 kilometers. The creation of aerial tankers has opened the door for even longer ranges of aerial flight.

After realizing the dream of flying, humans began to further explore the possibility of flying out of the atmosphere and into space. In 1961, Soviet astronaut Gagarin flew into space riding on the Oriental No. 1 spacecraft, finally realizing the human dream of leaving Earth. The United States Apollo Moon Program in 1969 put astronauts on the moon for the first time. On October 16, 2003, Chinese astronaut Yang Liwei rode the Shenzhou 5 spacecraft into space, making China the third country to achieve travel outside of Earth.

In the meantime, human space probes have successfully mounted extraterrestrial explorations of planets like Venus, Mars, and the planet type moon Titan and have conducted close-range observations of all seven other planets (excluding Earth) in the solar system. Space probes have even flown out of the solar system. Today we have a space station above Earth, allowing scientists to stay in space for longer durations and carry out various scientific research projects. The space station has begun to receive tourists as well.

3. Means of Media

Early newspapers and magazines were all printed in one place and then distributed all over the country. Those in the same city were able to read news in a timelier manner than inhabitants of other cities who to wait for a long time. For example, during China's Qing Dynasty, it took three or four months for newspapers to travel from Beijing to the cities south of the Yangtze River more than one thousand kilometers away. By this time, it was no longer news. Most newspapers and magazines did not even deliver to more rural areas, due to the constraint of technological conditions like transportation and communication.

Under the technological conditions of that time, major news that occurred in the areas where newspapers and magazines were located could be communicated in a relatively timely manner, but major news in other places—especially in remote areas—could not be reported in time.

With the advent of the telegram, the telephone, and other means of remote communication, this situation has undergone qualitative change. Nowadays, both news and communication technologies and press and printing technologies have undergone fundamental leaps. News can now be sent to news agencies, newspapers, and magazines from all over the world by email, fax, and telephone. The application of modern computer editing systems in particular has brought together communications technology and computer technology. News pieces can be written directly on-screen and sent directly to a magazine's central system from any corner of the earth, and computer photo-editing systems can complete layouts automatically and efficiently.

The application of satellite communication technology and optical fiber communication technology has freed global news from geographical and topographical constraints and improved definition, accuracy, and even confidentiality. In addition, newspapers and magazines are being printed and published in completely different ways, and edited content is sent to all regions of the world for local printing and distribution. Major newspapers and magazines are able to convey news to their readers quickly and efficiently.

The advent and application of radio and television was another major breakthrough in traditional media. The immediate and transmissible nature of broadcasting quickly made it a widespread new media tool. Cable broadcasting has also become prevalent, especially in socialist countries like the former Soviet Union and Eastern Europe. Televisions developed simultaneously with radio and cable broadcasting.

With the advent and development of satellite communications technology, today's radio and television networks can broadcast news from all over the globe in real time, be it from land, sea, or outer space. Due to the realistic nature of radio and television media, the impact of such media today has exceeded that of newspapers and magazines.

Another major breakthrough in media was the advent of the internet. Through the internet, we can read news and information from the world's major newspapers, magazines, news agencies, radio and television stations, various websites and self-media on computers and mobile phones, and from various government agencies, enterprises and institutions, schools, and research departments. These news stories are vividly illustrated instantaneous, and capable of reaching a wide range of consumers, marking the internet as a truly historic media breakthrough.

Many people today prefer to watch TV shows, movies, and news on the internet, and they are more willing to receive a variety of other information from the internet as well. The internet has woven itself into many aspects of society.

Three: Decrees of a Unified Society under Current Means

1. The Birth of a Political Power

Decrees are issued by the prevalent political power. The formation of this political power depends on the legal process of a large unified society. Measured by today's political values, the unified society should be a democratic society (there will be a special account of this later in this chapter). For discussion purposes, we will presume this unified society to be a democratic society.

A democratic regime should be elected by voters, either directly or through a representative system. Before being elected, each government official or politician should make themselves known to their constituents. Such understanding includes not only policy proposals and political performance, but also personal demeanor, family situation, and other important factors.

Aristotle, a thinker living in the Greek city-state era, described the ideal country in his book Politics. He thought that the population and size of an ideal country had to be just right—that is, the country's borders could be viewed within a glance and all adult men could hear the commands of the highest commander during wartime. According to his description, the ideal country would not exceed a population of one or two million people. Aristotle believed that only such a small country could enable everyone to have the opportunity to directly participate in the affairs of the state in a democratic manner. Aristotle's student—Alexander the Great—created a nation of unprecedented size spanning Europe and Asia, but it was a monarchy instead of a democracy.

Since entering the modern era, many democracies have emerged in the world. Some have populations totaling hundreds of millions and span millions of square kilometers. It is obviously impossible for such large countries to adopt direct political systems; thus, a system of representation is usually adopted. Voters elect politicians who can express their views to form representative organizations so as to indirectly participate in politics. Government leaders are either directly elected by voters or indirectly appointed through representatives.

The most extensive election of the unified society would be the election of world government leaders and parliamentary members. This type of election would involve all humanity—a scope unprecedented in human history.

Whether or not elections in such a vast area can achieve true democracy depends on whether each citizen eligible for election can cast their own vote objectively and impartially. The first condition to satisfy this will be for each voter to easily understand what he or she is choosing from. That is, he or she must be able to understand the political principles, policy proposals, behavior, and character of the candidate.

Achieving this goal on a global scale was unthinkable just a few decades ago, but it has become possible today. Through means like newspapers, magazines, radio, television, and the internet, candidates are able to state their policies in a timely and clear manner. Their voice, demeanor, and manner are readily available through the internet or on TV. Candidates who want voters to experience their charms more directly can even fly to all parts of the world by plane to meet their constituents.

Voting processes can be arranged either in a centralized place or individually at home through the internet. Computer systems on the internet can scientifically and rigorously verify the identity of voters and the validity of their votes. Global ballot papers can be rapidly processed by central computer systems, and the statistics of billions of votes can be displayed in seconds.

Many scholars believe that under today's conditions of information dissemination, direct referendum can be achieved through modern scientific and technological means, no matter the size of the country. The ideal democracy of Aristotle's small country can now be achieved in a global, unified society.

2. The Communication of Political Situations and the Relay of Government Decrees

The basis for policy decisions is the communication of political situations. In a unified society, situations at various levels of power must be communicated to the highest order of world organization—that is, the centralized departments of the world regime.

In a world regime, the political situation of the world will encompass the globe and cover all aspects of politics, economics, society, culture, ethnicity, and religion. The correctness and timeliness of world decision-making will depend on whether political situations in all parts of the world can be promptly and accurately reported to the relevant departments. In particular, some situations will require immediate attention, such as earthquakes, floods, tsunamis, and other disasters. They will need immediate rescue and response measures. Large-scale crime and social unrest will also require immediate resolution. If such situations cannot be promptly reported to the relevant departments of the world regime, very serious consequences may occur.

In 1976, the 7.6 magnitude Tangshan earthquake in China killed 240,000 people instantly and left nearly one million people crushed under the rubble, awaiting rescue. Reporting this catastrophic event to the central government as soon as possible was crucial. Tangshan was less than two hundred kilometers away from Beijing, but at that time the earthquake had destroyed the wired telephone lines and there was no wireless satellite communication. The messenger had to intercept a truck to send word to Beijing; it took almost seven hours for the news to reach the capital, and this was only forty years ago.

Such an inefficient method of reporting disasters will obviously not be viable in a large, unified society. Any major natural disaster tens of thousands of kilometers away will require timely communication in order to report the situation and send aid immediately; otherwise, the loss of life and property will be unimaginable.

The level of communication we currently have is enough to accomplish our intended goal. Telephone, fax, and email are all efficient tools for sending instant messages globally.

It can also very convenient to issue government decrees under such conditions of communication. The government decrees formed by the world regime, regardless of whether they need to be spoken orally or require the use of audiovisual or graphic forms, can be instantly relayed to their executors. Even original documents can be sent in a day or two using planes, trains, cars, or other means of transportation.

Sometimes the issuance of decrees requires meetings with people from all over the world in one location. Such a meeting would not take more than one or two days to organize. This would not have been possible before the Industrial Revolution—it would have taken at least a year to notify attendees and convene a conference back then.

Moreover, there are many ways in which meetings can be held nowadays. If the meeting does require physical attendance or is especially urgent, conference calls, videoconferences, or internet conferences are all viable options. Science and technology has made the world a much smaller place—that is why we call it a global village.

3. Implementation and Supervision of Decrees

The execution and supervision of decrees is closely related to transportation conditions. Let us start our analysis by looking at reactions to natural disasters, large-scale crime incidents, and social unrest as examples.

Under modern transportation conditions, if an earthquake or flood occurs and the world government decides to mobilize disaster relief personnel and relief supplies, air transportation will be the most immediate method. Even in the worst situation where resources need to be allocated to the furthest parts of the earth, response time will be a day and a night at most. Of course, it is more likely that the world government will allocate personnel and supplies in a reasonable manner on a global scale. In the event of an emergency, the first batch of personnel and materials will likely be transported via aircraft, while subsequent large-scale rescue actions will be transported by train or ship—both of which are extremely convenient with modern transportation.

If large-scale crime incidents or social unrest need to be dealt with, the military will be the main force mobilized by the government. Military response speeds should be rapid and they should be immediately available. Rapid reaction forces can be fully mobilized via aircraft or ground vehicles as soon as possible.

As for the supervision of decrees, government personnel in the various levels of the world regime should conduct inspections all over the world and promptly report the situation to corresponding departments of the world political power. With such convenient and efficient traffic conditions, as well as such timely means of communication, government inspectors will be free to fly to any part of the world for inspection and supervision. In most cases, any time spent in transit will not exceed one or two days.

In the meantime, supervision results can be immediately reported to relevant authorities via phone, laptop, or text. If face-to-face reporting is necessary, it will only take a day or two to do so.

The implementation of government decrees not only requires the effort of relevant government personnel, but also the cooperation of all global citizens; thus, various forms of media will be needed to inform people of the importance of each decree. The convenient, and speedy media forms will be a reliable guarantee for the effective governance of a unified society. Today's newspapers and magazines can be delivered all over the world on the same day. News from around the world and guidelines introduced by the government can reach the public on the same day too. Radio and television can immediately disseminate government policies and decisions, as well as broadcast live speeches from political leaders. People will be able to form a clear, unbiased understanding of their government's intentions. The internet can also be an important medium of

communication. Its immediacy, popularity, and huge information capacity will help the world regime promote and implement necessary principles and policies.

We can see that the fruits of modern science and technology have provided powerful guarantees for the smooth flow of government in a large, unified society. These are the necessary technical conditions for the effective governance of a united world.

We know that historically, Zeno, Kant, Marx, and Engels have all proposed similar ideas of human unity, but the technical conditions of their times were simply insufficient. Even in Kang Youwei's era, technical conditions for global management were not yet mature. Today, all these technical complications have been solved to satisfaction.

What needs to be clarified is that current transportation, communication, and media levels only mean that the technological conditions for a unified society have been met theoretically. The above expositions are all based on the universal application of existing scientific and technological achievements. Realistically, these technological conditions are not yet widely used by all people, especially in poorer countries and regions. In order for a large, unified society to be effectively governed, it is imperative that these technical achievements be widely applied to all regions and groups of the world. This is entirely achievable through human efforts.

It must also be emphasized that all scientific and technological achievements must be screened before being promoted globally. If any scientific and technological achievements are likely to endanger the overall survival of mankind, they must be limited. For example, whether the internet is suitable for promotion in a unified society requires additional in-depth study to determine.

SECTION TWO: MAXIMUM CHANGE WITH MINIMAL RESISTANCE

Since we have established the technical conditions for a unified society, we can assume that a unified human society is achievable through human operation. Even so, human operations can vary in difficulty. If a unified society is too difficult to achieve in the foreseeable future and its establishment time surpasses the deadline for human extinction, furthering discussion would be pointless; thus, it is necessary to conduct a realistic analysis of the resistance to such change.

One: The Brutality of Social Change

Throughout human history, social change has always been linked closely with brutality. Cruelty has been an enduring theme in social change, be it the replacement of small states or large shifts of regional or global influence.

The fundamental reason for this brutality is the contradiction between old systems and new ways of life. Social change generally occurs when the ruling class of the old system is replaced by the ruling class of a new system. Since the ruling class occupies a dominant position, it will most certainly use its dominance to safeguard the interests of itself and some specific groups. These

interests may be economical, political, or cultural, but they all belong under the happiness value category.

If social change is to take place, the old ruling class must be replaced. When this happens, the interest groups they represent are deprived of their happiness values. Some of these values will subsequently be adopted by the new ruling class and the interest groups they represent. In short, such social change generally robs happiness values from some people so that other people may acquire them. Those in danger of losing their happiness values will inevitably strive to defend their own interests, while those who seek happiness values of their own will inevitably strive for successful change.

This is just the beginning of the problem. In order to defend their own interests, the dominating group in power will take advantage of their dominance and employ any means necessary to prevent change. They may even use immoral methods like exile, imprisonment, torture, murder—even the murder of family and friends—to prevent change. Similarly, those who seek change are aware that the purpose of this change is only for their own happiness; therefore, they will also adopt extreme methods to totally defeat the ruling class. As a result, assassinations, terrorist attacks, and wars will inevitably take place.

Although the original intention of any change is limited to the acquisition of happiness, life will usually be lost in the process. Since the dominant ruling class will always be at an advantage, any social change will be met with huge resistance.

In order to safeguard its own rule, the ruling class will also implement a series of corresponding policies and measures to influence people's ideology and convince them of its legitimacy and reasonability; thus, more scientific and reasonable systems cannot be easily accepted by the people. As we can see from history, new ideas usually take centuries to be accepted, and even more centuries to finally enact change. Take the Renaissance movement as an example—it was actually an attempt to overthrow the Catholic feudal rule under the banner of classical European civilization revival. Because Catholic feudalism had imprinted deeply on people, it was very difficult to change systems of belief. As the first thought-liberation movement in modern human society, the Renaissance movement took two hundred years—from the fourteenth century to the sixteenth century—to achieve substantive effect. During this period, many thinkers and scientists were massacred and persecuted. The ultimate success of the movement was achieved through war.

The Enlightenment movement (i.e., the Second Ideological Liberation Movement), which was launched shortly afterwards, took more than one hundred years to produce actual results. In the seventeenth and eighteenth centuries, the Enlightenment championed rationalism, criticized the feudal social and political system, and attacked the theology of the Middle Ages; it also proposed the establishment of a rational society and state, paving the

way ideologically and theoretically for modern democracy. The success of the Enlightenment was marked by a series of great revolutions and major wars, including the American Revolution, the French Revolution, and the Napoleonic War, in which millions were killed and wounded.

At the root, it was the incredible nature of this social change that caused its brutality. At the same time, the ideological process necessary for this social change took particularly long to achieve as well. The Enlightenment itself was one hundred years in the making, but the Renaissance movement was a prelude to this social change, making the preparation time for this revolution roughly four hundred years.

The same is true for the communist movement. The goal of the communist movement was to overthrow the bourgeois rule and establish a socialist country with a proletarian dictatorship. There were no doubt sharp conflicts surrounding such a radical change, so its preparation time and brutality were extended accordingly.

The earliest socialist ideology can be traced back to the book Utopia written by More in the early sixteenth century. Since then, humans have pursued ideal societies and explored socialism for hundreds of years. The process of such exploration was also the process of ideology development. It was the birth of socialist thought by Marx and Engels in the nineteenth century that provided the theoretical basis for the establishment of a socialist regime. Further dissemination of these ideas eventually led to the establishment of a socialist state, and now the banner of communism flies over half the world. The brutality of establishing socialist regimes is obvious. The birth of almost every socialist country has been accompanied by bloody wars and armed uprisings. The establishment of the first socialist regime—the Russian Soviet regime—was immediately met with armed intervention by various capitalist countries in the world. The establishment of China's socialist regime claimed millions of casualties through war alone. All this undoubtedly resulted from the antagonism between the existing ruling class and the groups fighting for social transformation. When such direct and intense conflicts of interests occur, it often becomes a matter of life and death.

Two: The Fundamental Interests in This Change are Consistent for All Humanity

Generally speaking, the greater the scale of social change, the more difficult it will be. The difficulty comes when the dominant vested-interest-groups expend all efforts to uphold the existing system. When this occurs, it takes longer for the opposing party to accumulate enough power for change. Social transformation can only be achieved when the balance of power between the two sides is reversed. Due to the sharp antagonism between conflicting interests, all social change is difficult, takes a very long time, and is extremely brutal. These characteristics are intensified as the scale of social change increases.

The great social transformation from a country-based society to a large unified society will be far greater than any previous social change. Past social changes have all been changes within the state

system, whether institutional changes or a country's merge, division, or reconstruction. No matter what, these changes have been limited to the social form of the country. The shift from a country-based society to a large unified society is a fundamental change in the social form of human society; it is based on the precondition of the demise of all nations. The groundbreaking significance of such change is not only unprecedented, but it cannot be rivaled in the future. Does it also mean that the difficulty, time required, and brutality levels of this social change will also be unprecedented?

We know that unification is our only option and the last resort for humanity. Without global unity, it will be impossible to truly limit the development of science and technology. This social change relates to the overall survival of mankind and everyone's most fundamental interests. While the extinction brought about by science and technology may not directly endanger us, it is a crucial threat to our children and grandchildren, as well as all future generations.

Additionally, a unified society has the potential to bring about universal happiness for all mankind. Once mankind is unified as a whole, society will be much less competitive, and ethnic and religious integration may be possible. At the same time, a unified society is particularly suited to the promotion of equalized wealth. All of this makes the global unified society one without competitive pressure or knowledge renewal pressure. War and crime will decrease in frequency, and humanity will enjoy general affluence, health, and longevity. (These issues will be elaborated on in later chapters.) Moving towards unification will not only ensure the overall survival of humankind, but the overall happiness of humanity.

The profits of a unified society will benefit generations to come, indiscriminate of status. Unification aligns with the fundamental interests of all humanity, as there will be no conflicts of interest no matter what group or level people belong to. However, while global unification is consistent across humanity in terms of fundamental interests, fundamental interests often contradict visible interests. Fundamental and long-term interests require in-depth thought and wisdom and are often only championed by the most rational people. The majority of people will always be blinded by immediate and surface interests; therefore, a number of selfish individuals who choose to ignore the fundamental interests of all mankind will stand in the way of human unity.

Three: Resistance Analysis

The resistance to the unification of human society largely comes from the groups of people whose visible interests are compromised. Which groups are these, and how much resistance will they offer? We can start with the following analysis to find the answer.

First of all, among the general population, the biggest beneficiaries of a unified society will be the vast majority of poor countries, especially the small and medium-sized poor countries. These countries suffer poverty mainly because they have been treated unfairly historically; some have been ravaged by war while others have long been oppressed by colonialists. Since the rules of international competition are formulated by the rich and powerful, and the competition in modern

society is fundamentally a competition of science and technology, small and medium-sized poor countries are developmentally restricted due to their lack of funds, insufficient personnel, and poor management abilities. They are least capable of translating science and technology into productive forces; thus, they are bereft of the fruits and benefits of modern civilization.

Once the world comes under the integrated management of a world power, not only will poverty-stricken areas be treated impartially, but they will also receive help from all over the world. While a unified society is devoted to restricting the development of science and technology, it also emphasizes the universal promotion and application of existing science and technology that is well established and safe. Those small and medium-sized poor countries do not have the capacity or conditions for such promotion and application, but a central world government can fully popularize and apply the most appropriate scientific and technological achievements in these areas. It is completely possible that these areas may become sufficiently wealthy very soon.

Secondly, it's important to understand that the rich countries do not need to make any special sacrifices for the cause of unification, even though the inhabitants of poor countries will benefit from a unified society. This will result from the assistance and sacrifice made by the rich countries. Will the richer countries suffer great losses? That is not the case. Development and poverty alleviation in poor countries will depend mainly on the widespread promotion and application of existing science and technology; the main input required will be scientific personnel and management personnel. Although talent cultivation and support will require considerable investment, it will not place a great economic demand upon richer countries. Moreover, these kinds of investments can be compensated through other means.

We all know that since conflicts between countries often manifest in war, all countries invest greatly in their military. In a unified society where countries no longer exist, war will desist as well. With the integration of ethnic groups and religions and the establishment of a non-competitive society, crime rates will also drop. The military's main task will be to maintain social stability and to conduct relief operations during natural disasters. This will reduce the military's expenditure greatly—perhaps to one-tenth of what it is today. This means that more than 90 percent of global military expenditure will be invested in other areas. If these funds are partially invested in the development of poverty-stricken areas, they will have great impact.

A large, unified society can reduce spending in other areas as well. With the demise of countries, the governing bodies of all countries will disappear as well, and only the world governing body will remain; therefore, administrative expenses can be reduced. With the demise of countries, obstacles to regional exchange between those countries will disappear as well. In particular, obstacles to fair trade will disappear, all of which will result in the reduction of various expenditures. Much of this money could be invested in the aid of poverty-stricken areas, and poverty could be eradicated very quickly.

Third, the people of moderately affluent countries will also benefit in some way. Once the world is unified, and existing safe and mature scientific and technological achievements are universally promoted and applied, the world will attain an equalized level of wealth. This level of wealth will

be equivalent to or slightly higher than the level of affluence enjoyed by developed countries today.

Some portion of existing achievements in science and technology are yet to be applied today, but they will finally play their part in a unified society. Even the most developed countries cannot boast of having the most advanced science and technology in every aspect, but a unified society can. A unified society can aggregate the most advanced science and technology in the world and surpass any developed country today in terms of overall advancement; therefore, the standard of living in a unified society will be even higher than that of developed countries today. As a result, the people of moderately affluent countries and rich countries will enjoy some economic benefits as well.

Fourth, there will be no major change in the interests of middle and lower-ranking leaders of countries. Once unification is achieved, the middle and lower-ranking leaders of various countries will be retained, and the sectors they lead will remain largely unchanged in terms of scope. There will still be higher levels of leadership and management above them, so the visible interests of this group will not be greatly damaged.

Fifth, the top leadership of small and medium-sized countries will suffer most loss in terms of visible interests, while the top leadership of major powers will be the biggest beneficiaries. Since the highest authority in a county-based society is the state, the decisions and behaviors of the top leaders in each country are usually absolute and final. They not only enjoy glory and power of the highest level, but also gain many privileges and visible interests as a result.

A country-based society requires the coexistence of many countries, and each country has its supreme leadership level. In a world power, however, the number of leaders will be very limited, and the leaders of small and medium sized countries may play an extremely small role in the promotion of unification. They are most likely to lose power and privilege in this process, and they will suffer most loss in terms of visible interests.

The opposite applies to the highest leadership of major powers. Generally speaking, any major change in the political map depends on the efforts of major powers. The transformation from a country-based society to a unified society is more tremendous than any other in history, and it will rely heavily on major powers. The most capable leaders and groups of these major powers will undoubtedly be in a position to play the most important roles.

Most importantly, the unification of society is a great undertaking that will save mankind and enable universal happiness. Its significance has no precedence and can never be rivaled; such a meaningful undertaking will be the dream of any capable political leader. Those who play an important role in this process will no doubt leave their mark on human history forever. In addition, the top leaders of major powers will be most likely to emerge as the leaders of the world power; therefore, the leaders of major powers will be the biggest beneficiaries of a unified society.

To sum up, unification is not only in the interest of all mankind but can also grant visible benefits to the majority of ordinary people. If this idea were to be promoted to the people, they would become the most powerful force in global unification.

In the leadership class, the middle and lower-ranking leaders will not lose many visible benefits, but they will benefit greatly from unification. Additionally, such a cause has great significance to the survival of humanity and includes the fundamental interests of all peoples, so the leaders of this group will also be supporters and promoters of the unification cause.

The greatest obstacle to world unity will probably come from the top leadership of small and medium-sized countries. They will be the greatest losers in terms of power and privilege. A considerable number of them will consider the cause of global unity to be worthy of personal sacrifice and become agents of change; however, a small number of extremely selfish individuals may disregard the survival of mankind as well as the happiness of future generations in order to cling to their power. They will be the clowns that stand in the way of a unified society.

If these people oppose global unity, they could do considerable damage due to their leadership status. They might be able to mislead the people of their countries though their own policies and propaganda. In this regard, this group of people will be the main impediment as well as the strongest resistance to social unity.

Correspondingly, the top leaders of major powers are likely to become active promoters of global unity, since they would also become the biggest beneficiaries. These people could do a great deal of good by mobilizing their countries to support the cause of unity. At the same time, the influence of major powers is not limited to themselves, as they also have the ability to call upon other nations or regions of the world. Though such major powers are only a small portion of the world's countries, the have global influence that cannot be matched by smaller counties.

The top leaders of major powers are not only most likely to actively promote the process of unification but also have the greatest ability do so. If the top leaders of the few most powerful countries were determined to act in unison, global change would be possible. In short, the top leaders of major powers are the most dependable strength for the cause of unification.

From the above analysis, we can see that although the transition to a unified society is an unprecedented social change in human history, its consistency in the fundamental interests of mankind and its benefits to the top leaders of major powers may result in relatively small overall resistance.

SECTION THREE: THE UNIFIED SOCIETY—A PREVIEW

The human world is complex and plagued by many problems. At present, the most serious problems people are aware of are war, environment issues, resource shortages, and poverty. These problems cannot be solved by one country, which is why there has always been a strong demand for global coordination and unification. Many international organizations were born from such

desires. The United Nations is most representative of these international organizations. As a universal international organization, it has devoted itself to the coordination of nations as well as the unification of global actions, and it has made many contributions to this end.

At the same time, the global economy is becoming increasingly integrated. Commercial trade has already broken through national barriers, and markets are no longer closed or independent. In order to unify the world market and coordinate world trade, the World Trade Organization has been established, and many regional trade organizations have also emerged. In some respects, the integration of the world is already taking shape.

Both the series of unifying global initiatives undertaken by international organizations and the integration of world trade mark a momentum towards global unity. Though neither is a deliberate pursuit of unification, they are still tentative steps toward a unified society; thus, we may consider these trends to be a preview of the unified society, because they carry certain characteristics of a unified society and may reveal the objective trend of human society development upon deeper study and analysis. This coupled with the influence of existing technical conditions on global governance may provide us with a more objective understanding of the possibility of global unification.

One: International Organizations and the Unified Society

After World War II, international organizations sprang up in abundance. The two most influential regional organizations in the world were the North Atlantic Treaty Organization headed by the United States, and the Warsaw Pact led by the Soviet Union. These were actually two major conflicting military groups. Other influential regional organizations included the European Union, the Association of Southeast Asian Nations, the League of Arab States, and the Shanghai Cooperation Organization. In addition, many other regional professional organizations held considerable influence, such as APEC and the Organization of the Petroleum Exporting Countries.

The most influential organization in the world today is obviously the United Nations, as well as the international trade organization known as the Economic United Nations. In addition, other professional world organizations, such as UNESCO, the World Health Organization, and the International Monetary Fund, have great impact as well. At the same time, many non-governmental international organizations try to play their part; examples of these include the International Federation of Students, the World Youth Federation, and Greenpeace.

International organizations are all borne of specific needs and circumstances. Most regional international organizations were established to enhance the collective competitiveness of member countries, be it military, political, economic, or resource competitiveness; therefore, the purpose of regional international organizations is generally not in line with or even contrary to the goal of a unified society.

The purpose of global organizations is just the opposite. These international organizations are generally established in response to the universal demands of all countries in the world and

revolve around the common interests of mankind. The United Nations in particular is deeply rooted in the catastrophe and misery caused by World War II. The purpose and objectives of such global international organizations are always in line with human unification. Their work, regardless of effectiveness, will in fact be linked to the future formation of a unified society. Moreover, the technical means employed by international organizations are also highly consistent with the technical means to be adopted by the world power of a future unified society. Therefore, the workings of international organizations today can offer some insight into the unified society of the future.

Take the environment as an example. Environmental protection is an important issue for mankind, as the serious environmental pollution since the industrial revolution has garnered the attention of many people. Even in a unified society, such an issue would be an important task for the world government. The United Nations has been devoted to this cause since the early 1960s, at which time several meetings were held and a series of environmental resolutions and conventions were passed. The series of UN actions has popularized the goal of "Save Our Earth" among the world's people.

The issue of population is equally important. The development of medical and pharmaceutical technologies as well as the backward approach to birth control in certain regions has led to a sharp increase in the world's population, and this growth trend is still accelerating. This phenomenon has been coined the "population explosion." The issue of population will also be an important social issue for the unified society, even more so than it is for national communities today, because the limitation of science and technology development in a unified society may also limit the amount of food and resources generated by such technologies. If population were not strictly controlled, the unified society could face starvation. The United Nations established the Population Commission in 1947, and the issue of population has remained crucial over the years. The UN has also held a number of special sessions to discuss population issues, and it has adopted a series of resolutions and programs as well.

The UN has never ceased its efforts in the fights against poverty and terrorism, or as it has advocated for the protection of human rights and drug prohibition. It has held many global conferences and has tirelessly carried out task after task. Looking to the future, none of these issues can be solved in a short period of time. The unified society must continue to work on these vital issues.

The United Nations is the most extensive international organization in the history of mankind and has been the most capable of representing and safeguarding the interests of humanity. During its sixty-year tenure, the United Nations has contributed greatly to the overall interests of humanity, showing that its formation has been most beneficial to mankind. It has always strived to conduct multilateral coordination and to pass decisions through general voting processes. Such voting procedures have been efficiently facilitated by the technology of today.

The United Nations Millennium Summit held at the UN headquarters in New York in September 2000 is a typical example of this. The leaders of more than 150 countries attended the Summit,

and over eight thousand policemen were dispatched by the NYPD. From September 14 to September 16, 2005, the leaders of over 160 countries gathered at the UN headquarters again to celebrate the sixtieth anniversary of its founding. This was the largest summit to be held since the founding of the United Nations, and more than three thousand journalists attended. Meetings of such massive size have considerable global significance.

The 2005 meeting completed its intended agenda smoothly, and security was extremely efficient as well. However, it was extremely difficult to pass the relevant documents prepared for the meeting. The most important document of the meeting was the Draft Outcome Document. To complete this document, the United Nations had set up a special core group of thirty-two countries, including the United States, China, and Russia. Unfortunately, it was difficult for the core group to reach an agreement; after months of hard work, the document was barely adopted the day before the General Assembly. The final document had been reduced from its original one hundred pages to thirty-five pages; elements like disarmament, development, the definition of terrorism, and denuclearization were all excluded due to conflicts of interest.

The success of the above global summits was largely dependent upon the very accessible transport and communication conditions of the time. Such meetings would have been impossible under the technical conditions of one hundred years ago. Of course, the great deal of coordination and liaison done by the United Nations in advance was also crucial.

The convenience of transport and communications has also aided the United Nations in effectively implementing many decisions concerning global operations. Whether it be peacekeeping operations or disaster relief, as soon as all countries reach a consensus, forces can be quickly mobilized to the target destination. In most cases, time is usually wasted debating and bargaining over the decisions.

Analysis of a global organization like the UN in comparison with a unified society reveals the following differences and similarities:

1. Prior to decision-making, the United Nations must devote great efforts to coordinating the positions of all countries. Such a coordination process tends to be very long and greatly complicates the reaching of decisions. In particular, when one or two key players disagree on any major issue, decisions will not be made or will be impossible to implement.

The world power of a large unified society would also need to coordinate the positions of all regions due to their varying features and partial interests; however, as a global regime with centralized executive power granted by law, the world power would be able to make final decisions when necessary. Such decision-making would not be overly prolonged, and the compilation of all regional opinions would happen relatively quickly.

The voting process of the United Nations shares one commonality with that of the unified society: once consensus is reached, convenient transportation and communication conditions, as well as other technical conditions, allow for quick, decisive action.

2. The UN's decision-making process is permeated by power plays; some issues cannot be resolved due to the attitude of one country. At present, there are 193 member nations in the United Nations, but many major issues are influenced by the one vote from the United States. In other words, the United States alone is enough to veto certain UN decisions.

In a unified society, all the regions of the world would be on much more equal footing. Though regional voting rights may differ due to population, economic, or cultural factors, the differences would not be overly large. No one region would be able to affect the decisions of the world power.

3. The weight of each country in the United Nations depends largely on the strength of its military. A strong military power can often influence the decisions of the United Nations; this is actually a manifestation of power politics. A unified society, however, would not allow regions to possess their own independent militaries. The armed forces of the unified society would be directly in the hands of the world political power; therefore, it would not be possible for any region to influence the decision of the world power through military might.

4. In all the work of the United Nations, issues concerning war and armament reduction have always been the most difficult, the most important, and the most contradicted. The UN must jump through many hoops to formulated even the smallest decision in these regards. Contrarily, a unified society would not have regional war and armament issues. The small number of troops under the unified society would follow the regulations and laws of the world power to target a small number of small-scale wars, crimes, and separatist actions.

5. The United Nations' decisions often take the form of declarations, conventions, treaties, or agreements. This shows that as an international organization, the decisions of the UN are made on the basis of voluntary implementation by all nations; however, the decisions of the world power in a unified society will undoubtedly appear in the form of orders, decisions, demands, and instructions. The decisions of the world power will inevitably be implemented with much greater force.

6. Due to the sovereignty of countries, the United Nations cannot enforce its decisions and principles on independent countries. Generally, the United Nations has no means to impose any restraint on countries without the support of major powers. Many acts that violate the UN's decisions are in fact perpetuated by major powers—open opposition of such actions would only result in world war. A world power, however, will be backed by absolute centralized power and will be able to restrain and impose actions upon any region that violates world principles and laws. It will hold regional leaders responsible, replace them if necessary, and even bring legal charges against them. Most regional leaders will not take such risks; thus, isolated incidents will be easy to deal with and will not result in major consequences.

Two: Globalization and the Unified Society

Today, globalization is one of the important issues of our time. Convenient transportation, cheap and timely communication, as well as rich and intuitive media have all shortened the distance

between people and created a “global village.” A broad understanding of globalization should include all aspects of politics, economics, military affairs, culture, science and technology, as well as society. Regardless of whether you know the term “globalization” or feel the impact of it, globalization is everywhere around us.

Beijing serves as an example of globalization. This five-thousand-year-old ancient capital has long shed the shadow of history and emerged into the modern world. Of course, the Forbidden City still stands, and the Temple of Heaven, the North Sea, and the Summer Palace still retain their Ming and Qing dynasty facades, but only as deliberate monuments to China’s rich history. Beijing teems with Western signs like McDonald’s, KFC, and Pizza Hut. German Mercedes-Benzes and BMWs, Japanese Toyotas and Hondas, American Lincolns and Buicks, and South Korean Hyundais all run on the streets. People can be seen drinking Coca-Colas and Starbucks; wearing French and Italian clothing; holding Nokia, Huawei, or Samsung mobile phones; and watching Hollywood films and South Korean idol dramas on all types of TVs. We can clearly see that various lifestyles and cultures permeate and integrate with each other. This globalization of culture and lifestyle is by no means limited to cities like Beijing. It has infiltrated small and medium-sized cities as well as remote rural and pastoral areas.

The popularization of smartphones, radios, and televisions, as well as the convenient means of transportation and communication, has enabled the general population to feel the integration of the world. All people are being unconsciously swept along in this globalization process, and this trend is especially obvious in developed countries.

We can start with an analysis of military globalization. The Warsaw Pact and the North Atlantic Treaty Organization were two of the largest worldwide military alliances, and they can also be described as a form of military globalization; however, they were confined to regions and were contradictory in nature. It is more accurate to call them contradicting international military groups. Similarly, political international organizations like the European Union, the Arab League, the Association of Southeast Asian Nations, and the Shanghai Cooperation Organization are all limited to regions or groups. These organizations unite for competitive strength and are more about international confrontation and divide than globalization.

People are more aware of economic and technological globalization. These are narrow definitions of globalization, but they are veritable forms of globalization. Economic globalization first manifested in the integration of the world market. When we walk into a mall these days, we can easily find all sorts of products from all over the world. Items from all over the world have been brought together in one counter or aisle.

When the first round of negotiations surrounding the General Agreement on Tariffs and Trade was held in Geneva in 1947, there were only twenty-three members. Membership increased substantially as time went on. This provisional body was finally reorganized into the permanent World Trade Organization in 1995. The birth of such an organization is a true reflection of the irresistible trend of economic globalization. To date, the World Trade Organization has 164 members and its total members trade has reached 98 percent of the world’s total trade.

Economic globalization is also reflected in the globalization of product production. The United States' Apple brand commissions most of its production from Shenzhen, China; many of Lenovo's components are manufactured in Taiwan; Airbus and Boeing aircrafts source components from all over the world—China's aviation manufacturers occupy 5 percent of the Airbus A350's production, and the Boeing aircraft is coproduced by 340 companies in twenty-three countries, including the United States.

Another manifestation of economic globalization is the globalization of corporate investment sources. Today, companies like Airbus, BMW, General Motors, Tencent, Alibaba, and Baidu are all owned by more than one country. They are invested in internationally and their shareholders are distributed around the world. Such multinational corporations can no longer be simply defined by the concept of countries.

Economic globalization is also reflected in the globalization of investment objectives. Any multinational company will set the world as its investment target. It will place its manufacturing plants in areas close to markets with low production costs and beneficial investment environments.

Globalization of technology accompanies the globalization of economy. New technologies spread around the world just as quickly as new products. From the perspective of globalized technology trade alone, the global trade in technology reached an average of 2.5 billion US dollars in the mid-1960s, 50 billion US dollars in the mid-1980s, and more than 200 billion US dollars in the mid-1990s. In the meantime, the import of information and communications technology reached nearly two trillion US dollars—the growth of the technology trade has far exceeded the growth of global economy.

The globalization of technology also includes the globalization of higher education. As training centers for scientific and technical personnel, colleges and universities have become the source for promoting the competitive advantage of enterprises and nations. Over the past forty years, the number of students studying abroad has grown at an average rate of nearly 4 percent annually. Additionally, university teachers are becoming more globalized; 20 percent of newly hired professors in the fields of science and engineering in the United States are born abroad, while most of China's top universities employ teachers from foreign countries. Some of the larger cities in China have hired foreign English teachers in primary and secondary schools and even kindergarten. It is not hard to see that globalization has undergone a qualitative change due to the change in human communication methods. It is precisely the highly developed means of transportation, communications, and media that has made globalization a possibility as well as an overwhelming trend.

In the course of its development, the globalization of the economy needs to be supplemented by new global community. For example, the globalization of the economy is also manifested in the globalization of finances. The dollar has become almost a universal currency in the world, while the euro and yuan are constantly trying to challenge its dominant status. The globalization of banking has made transactions in different currencies between distant banks possible and easy. This has made global economic activity and world trade even more convenient.

Financial globalization is also changing people's way of life. We can travel anywhere in the world with just a credit card, so travelers not only bring tourism income but also different ideas, lifestyles, and perspectives, making world culture even more globalized.

The trend of cultural globalization is also a result of modern technological globalization, but the extent of cultural globalization cannot be compared with that of economic and technological globalization. This is because cultural heritage is closely guarded by all countries. We would not expect an extreme Islamic nation to allow women to wear bikinis in a pageant contest any more than we would expect Western countries like the United States or France to require women to wear veils in public. Modern technological means can promote a broad, multidimensional and multi-regional globalization effort. In this process, countries are often the obstacle to globalization.

The process of economic globalization is often beneficial to national interests. In particular, developed countries and countries with technological innovation capacities are always the biggest beneficiaries of globalization. While some less-developed countries may be more passive in the process of globalization, they benefit more by accepting globalization rather than resisting it; thus, economic globalization can often be easily achieved without the impediments of nations.

The globalization of culture is a different matter. Governments of open-minded countries will impose fewer restrictions on modern media, and cultural globalization may take place more straightforwardly. Contrarily, censorship and media restriction in other countries may impede the integration of culture. When I traveled to North Korea, I discovered that the TVs in Pyongyang's hotels were only able to receive two government channels. Under these circumstances, cultural globalization is certainly impossible.

Interregional cross-sectoral political and military globalizations are even more impossible to achieve in a country-based society. Politics and militaries are the essence of state sovereignty as well as their final line of defense. If political and military globalization were to be achieved, it would satisfy the basic characteristics of a unified society. Once that happened, the social form would no longer be nation-based.

Analysis of current globalization trends reveals an exciting fact: globalization is not forcibly promoted by governments through artificial forces; rather, it is a spontaneous action that reflects the strong and unconscious aspirations of people towards global unification. The national government has played a repressive role in such a process of globalization. Without such suppression, the content of globalization would become even richer, and the degree of globalization would become even more in-depth.

We can assert that with a little more promotion, globalization will inevitably become even broader, deeper, and more comprehensive. Once globalization extends to every aspect of politics, military affairs, culture, and society, it will signal the advent of the unified society. At its root, the unified society itself is a type of extensive, in-depth, and comprehensive globalization.

To sum up, whether global operations are promoted by international organizations or emerge spontaneously, a mode of operation similar to that of a unified society is being quietly formed in the world. Objectively, this has formed a preview of the unified society that may come. By analyzing this preview, we can draw the following conclusions:

1. The series of unifying actions taken by international organizations as well as their operation models are all tests of modern communication conditions on a world scale. They demonstrate that the technical conditions for world governance have reached maturity.

2. The action of world unification is a common aspiration of the people. This appeal first manifested itself in the establishment of international organizations that would coordinate world affairs for the common good and prevent war. Though such international organizations were not able to influence countries, they contributed greatly to the unity of society and the overall interest of mankind; thus, these international organizations have provided important lessons for the unification of human society.

3. The trend of globalization is a spontaneous initiative and an irresistible trend. From this trend, we also see that the peoples of the world share a universal desire for unity. This trend is not just a desire of the people, but also a necessity of history.

We can clearly see that a unified human society is a distinct possibility. With the full maturity of technical conditions, the experience gained from a preview, the universal yearning of the people, as well as the just goal of saving humanity, is there a force strong enough to stop our progress?

Chapter Ten Basic Considerations for Human Unification

Previous discussion has made it clear that today's level of science and technology is enough to satisfy the technical conditions required of a unified human society. Moreover, though the move from a nation-based society to a world power will be the greatest social change in human history, we have proved that the resistance it will encounter is relatively minor. All this clearly tells us that as long as the goal of unification is reasonably implemented, it may be achieved in a relatively short period of time.

Thus, this chapter will discuss the reasonable implementation required to achieve our goal of unification. In other words, what path must we chose to realize world unification?

SECTION ONE: MEANS AND STEPS

One: The Basic Idea: A Peaceful Transition

The unification of human society will bring about the demise of countries and the advent of one centralized world government. In a unified society, the highest administrative power will be transferred from state governments to the world government, from coexisting multinational states to the sole world power. Such a transfer will be unprecedented in human history, and it is the only way to guarantee the most essential and fundamental interests of all mankind as well protect humanity from self-extinction.

In spite of this, the realization of a unified society will threaten the visible interests of some people. While some of these people may put the interests of humanity first and support unification, others will go against the interests of mankind and resist—by armed opposition if necessary. There are two possible events that may lead to global unification: peaceful transition or all-out war.

Generally speaking, no sort of large political change can be reached through peaceful negotiation or war alone. More often than not, change is achieved through a combination of peaceful negotiation and war. The general approach to global unity can either be a one-step program or a transitional tactic.

The one-step program refers to a direct process of achieving unification in which the multinational society is transformed into one global entity governed by one world power. The transitional tactic refers to the establishment of an intermediate transitional phase in the transition from a state-based society to a large, unified society. In this transitional period, factors that are not conducive to achieving unification or long-term peace and stability of the unified society will be targeted, remedied, adjusted, and transformed.

The great cause of unification is above all an attempt to save humanity. It is a great cause of incomparable justice. Naturally, any just cause should also be promoted through just means—which eliminates war as a tactic. Therefore, peaceful means will be the basic starting

point of our design. Previous analysis shows that unification is universally consistent with the fundamental interests as well as visible interests of all mankind, and it greatly benefits the top leaders of human society; thus, a peaceful transformation is actually possible. When we consider the actual steps needed to word towards a unified society, however, the immense difficulty of bringing together so many different regions and countries comes to light.

First of all, there is an enormous divide between the countries of the world. Economically, there are hundredfold differences in the per capita income of the richest and poorest countries. This type of wealth gap makes integration very difficult, and it requires compromise that is hard to achieve. Moreover, huge economic differences will inevitably lead to different education levels, living habits, and personality traits. Integration of a society made up of so many different elements will be immensely challenging.

Secondly, from an ethnic point of view, a certain level of ethnic conflict and even hatred exists between the many nations in the world. It will be equally difficult to overcome ethnic disputes that have been passed down for generations. Even if ethnic unification can be achieved, there is no guarantee that these problems will be truly laid to rest and not cause future unrest. Ethnic killings and blood revenge may still occur and will have a serious impact on people's recognition of a unified society. All this may bury seeds of dissonance in the fundamental governance of a unified society.

Third, religious issues could impede the process of unification. The historical hatred of some religions in the world has lasted thousands of years, and the power of religious belief often makes acceptance exceedingly difficult. Even more troubling is the fact that a handful of countries in the world are religious extremists. Concessions to countries dominated by infidels are seen as a form of religious betrayal. Religious sentiments will be a big hurdle in the path for compromise.

Factors that affect the process of unification far exceed those listed above. For example, political and cultural differences may also affect the realization of a unified society. The attitude of national leaders is another crucial factor that may determine the success or failure of unification. The will of a nation is often manifested primarily through the leaders of that nation, and while democratic leaders may respect the opinions of the people a little more, authoritarian rulers will certainly not hesitate to impose their own will on their citizens. Global unification will include all the countries of the world; some may be democracies, but there will be many others under autocratic rule. The complexity and variables of the situation can only be imagined. With so many countries in the world, it is inevitable that some national leaders will try to hinder global unification by all means possible.

Because of the abovementioned series of factors, we believe that a transitional process for global unification may be more feasible; therefore, peaceful resolution and a transitional tactic will be the basis for our plan to achieve a unified human society. Even so, we cannot deny the possibility of a one-step approach. If broad consensus were to be reached all over the world, and people of all countries truly grasped the sense of crisis, the handful of opposition and difficulties mentioned

above could be overcome. We are only discussing the transitional approach here because the ideal situation of one-step unification is much more difficult to achieve.

During the transitional process from a nation-based society to a unified society, the following should be achieved:

1. Balanced economic and social development across the world

Low-income areas should receive assistance in terms of development, and mature scientific and technological achievements should be promoted to these low-income areas. Theoretically, once existing scientific and technological achievements are evenly applied throughout the world, the per capita income level in all regions should equalize.

2. Regional integration promotion

The promotion of regional integration will be one of the most fundamental tasks and ultimate goals of the transitional period. Much work must be done in this area, such as constant dilution of the concept of nations and strengthening of the concept of mankind; promoting unified moral values, a unified language, unified living habits, and promoting ethnic and religious integration. This could promote a soft environment for world integration and harmonious coexistence.

3. Gradual establishment of the hard (technical) environment for world integration

Today's technical conditions have fully satisfied the requirements of a unified society and made world governance infinitely achievable; however, we should also see that the world is still unevenly developed. Many countries do not yet have highways, and many areas still lack lights, telephones, radios, and even cars. The transitional period will be tasked with communication exchange and technical integration to create a favorable hard environment for a unified society.

In addition, the transitional period will also be tasked with the exploration of an effective management approach for the future unified society. At the same time, since many aspects of the transitional period will differ from those of the country-based society, actions to limit the development of science and technology can also be explored.

Two: The Basic Choice: Close-Knit Groups of Absolute Superiority

The transitional period will be established to promote a smoother transition from a country-based society to a unified society, but it will also seek to guarantee more effective, stable, and long-term governance for the unified society.

During this period, many factors will affect the realization of these two goals. These factors must be adjusted, rectified, rebuilt, and eliminated in order to ensure the smooth progress of global unification.

There will be many possible options for the transitional period, and any option that will be conducive to the aforementioned goals can be seen as a viable option. In fact, the determination of the transitional approach will be largely determined by the attitudes of national leaders as well as the public. No option will receive a 100 percent satisfaction rate, but the ultimate option will be the one that receives maximum support from the most influential leaders and countries. This may not be the most reasonable option, but that is the reality of human society. We can analyze and study the conditions of human society to generate the most theoretically reasonable option and use it to sway the general public as well as the most influential political leaders in the world. This may pave the way for a most suitable transitional program.

The transition to a unified society can be generally understood as the consolidation of all countries in the world into one whole. In that way, this transitional process will have the features of country consolidation. Historically, the most peaceful means of country consolidation have been achieved through the coalition of nations. Let us analyze the transition towards nation coalition as a starting point for our discussion.

1. Several Possible Forms of Coalition

The use of coalitions for transition relies on the links between countries to form a more powerful national coalition. This type of national coalition will be established for the sole purpose of promoting unification. It will continue to strengthen the close ties within the coalition as the timeframe matures, until the entire world is united into one.

If all countries were allowed to form coalitions on their own, their motives for aligning would be multifaceted. Even if the principle of unification were widely recognized on a global scale, it would be impossible to ensure that all alliances would be formed purely in regard to this cause.

Some of these coalitions may be designed to promote global unification, but some may be devised for other purposes.

The forms of coalitions will certainly be manifold. There may be economic alliances, political alliances, military alliances, and so on. Furthermore, these alliances may be closely or loosely linked; closed or open; regional, ethnic, cultural, or ideological. In any case, we can be certain that some forms of national coalitions will not be able to shoulder the task of unification promotion. For example, it would be difficult for a national coalition linked solely by economic ties to achieve global unification. Any loosely linked national coalition would also fail under such heavy responsibility.

The coalition most likely to achieve unification would be a closely linked one that contained important elements like politics, military affairs, and economics. It will require participation from the supreme powers of the world so that no contention will be possible. Only a national coalition of this scale will be able to win the recognition of other non-coalition countries and carry out the cause of global unification.

There are many kinds of alliances today—too many to clearly count. Examples include the European Union, the Association of Southeast Asian Nations (ASEAN), the League of Arab States, the North Atlantic Treaty Organization, the Warsaw Pact, the North American Free Trade Area, and the South Asia Free Trade Area. Some coalitions are very close-knit; federal states are so closely aligned that they are actually a single country. Other coalitions may be so loose that there are no actual restrictions among countries. We will only focus on the national coalitions capable of directly promoting and playing leading roles in unification.

2. The Characteristics of Coalition in a Free State

Historically, coalitions between states have formed out of free will. As the most supreme powers of human society, countries are free from external restraint and can decide the objectives, content, and actions of coalitions according to their own needs. Coalitions cannot limit the actions of independent states, and countries are usually free to act as they will. We will refer to this unrestrained state of the countries as the free state.

a. Coalitions are either formed due to confrontation or generate confrontation due to formation.

Free-state coalitions are generally established for confrontation. Even when they are not established for this express purpose, they often generate confrontation by disturbing the objective balance of power. These confrontations can be economic, political, military, or comprehensive in nature. For example, the pan-Islamism movement emerged due to the invasion of Western countries and the proliferation of Christian civilization. The goal of the pan-Islamism movement was to unite all Islamic nations into one big alliance to better resist the invasion of Western powers.

The Axis powers were established in an attempt to dominate the world and strive for German occupation. Hitler united Italy, Japan, and Germany in order to form a national coalition capable of opposing the overall powers of Britain, France, and the Soviet Union. The attack of the Axis powers took Europe by surprise; as a result, the United Kingdom, France, and the Soviet Union quickly became allied nations. Eventually, they were joined by the United States and China. The same principle applies to the NATO and the Warsaw Pact during the Cold War era.

Economic alliances are also formed for competitive advantage. The North American Free Trade Area was formed to compete economically with the European union; the ASEAN Economic Community was established to contend with the powerful economic forces of China, Japan, and India. Of course, economic competition is usually less fierce than political and military confrontation, and receives less attention from the world.

The League of Nations and the United Nations were both coalitions that sought to include all nations in the world; therefore, they are different from the national coalitions discussed above. In other words, if the League of Nations or the United Nations had been able to completely influence

global affairs, they would have completed the transition into a unified society, and our discussion would be meaningless.

b. Coalitions in the free state are pluralistic coalitions.

Since free-state coalitions are always born of or generate confrontation, their confrontation must also be somewhat targeted. Once a national coalition is established, their target will be established as well, whether they choose to publicly disclose it or not.

The aligned force produced by a national coalition is a repositioning of the balance of power among all member countries. Correspondingly, in order to resist targeted action and enhance their own strength, the country or countries being targeted will contact other countries with similar interests to form their own coalition as well. The confrontational nature of national coalitions means that they will always be pluralistic, not singular. That is to say, one or more of the same type of national coalition will always coexist in the world at the same time. They may not be established simultaneously, but the time gap will not be too large. This is true of economic alliances, cultural alliances, military alliances, and political alliances, with the latter two being particularly obvious in this regard.

c. Confrontational coalitions will continuously expand.

Since national coalitions are usually founded in rivalry, they will appear in pairs and both sides will constantly seek to overpower their opponents. This characteristic is especially strong in military and political coalitions, since any weaknesses could threaten the survival of countries. The initial size of the national coalition will not be maintained but will expand continuously to absorb new members and consolidate competitive advantage. Since all opposing camps will be making such efforts, the size and scale of each coalition will be constantly increasing.

Before World War I, France moved to further alliance power by aligning with Britain after it gained Russia as an ally, establishing the Allied Powers. But this was only the beginning. As the competition between the Allied Powers and the Central Powers intensified, the race for new alliances intensified as well. Eventually, even Italy, originally a Central Power, was absorbed into the Allied Powers, along with Romania and Greece. Even distant countries like China, Japan, and the United States were won over by the Allied Powers. This influx of members ultimately changed the balance of power and led to the success of the Allied Powers.

The Central Powers made great efforts as well. They succeeded in attracting Turkey and Bulgaria, both countries with important strategic positions and strong land armies. More importantly, the Central Powers successfully forced Allied Powers member Russia to sign an alliance before the war ended. Russia was forced to make financial and land reparations and ultimately withdrew from war, thus lifting the Eastern threat to the Central Powers.

During the Cold War, NATO only had twelve initial members; it was the addition of Greece, Turkey, and West Germany that consolidated its strength. In reality, the power of NATO was not

limited to Western European and North American countries. Japan, South Korea, and Taiwan in the Far East were all under NATO's influence.

The rival Warsaw Pact Group was doing exactly the same thing. Not only did it win North Korea, Vietnam, China, and other countries in the East, but it also succeeded in distancing NATO heavyweight members such as France and West Germany from the alliance.

d. Semi-close coalitions are most likely to result in conflict.

In a closely linked coalition, the rise of the member states is very consistent, and all countries will be careful to act according to agreements. Since parts of each country's sovereignty has been assigned to the coalition, the coalition will act like one nation when dealing with foreign matters (federal states are such coalitions).

Semi-close coalitions will function very differently. On the one hand, the members of the coalition will extend mutual aid and agree to binding agreements; on the other hand, these countries will also take separate actions outside of the coalition's scope. This is when problems arise. Since each country has their separate and individual interests outside of the coalition, they will likely take actions that may conflict with members of the opposing coalition. The more members each coalition has, the more conflicts will arise and with greater frequency. Furthermore, since members of the same coalition share similar interests and obligations and will hope to receive aid in situations of conflict themselves, they will support their coalition members without questioning right or wrong. The members of the opposing coalition will act along similar reasoning; thus, the conflict between two countries will quickly escalate into large-scale conflict between two coalitions.

To put it simply, under a semi-close coalition, individual countries will easily drag the entire coalition into confrontation over some small trouble. Since individual countries will come across conflicts frequently, semi-close coalitions will often be engaged in large-scale conflicts. For example, World War I was ignited by a small clash between the Austro-Hungarian Empire and Serbia. The Austro-Hungarian Empire had long entertained territorial ambitions toward Serbia; the assassination of the Archduke of Austria was merely an excuse for war. The ensuing world war was an escalation of this regional dispute between Austria-Hungary and Russia. Without the support of the Central Powers—especially Germany—Austria would not have dared to invade Russia. And without support from the Allied Powers, Russia would not have been able to resist Germany and Austria-Hungary alone. It was the interference of the two coalitions that ultimately resulted in global war.

Such huge confrontations would be less likely to occur between completely loose coalitions, since such coalitions would generally ignore the plight of their member states. On the other hand, close-knit coalitions would rarely allow such independent actions. Only semi-close coalitions are likely to be dragged into large-scale conflict due to the actions of certain member countries.

3. Free-State Coalitions Cannot Shoulder the Heavy Responsibility of Unification Transition

A coalition-based transition method relies on the coalition to strengthen the bond between countries and expand the scale of the coalition. Once the coalition has all members of the world as its members, and the members are closely united as one country, the unified society will become reality. If transition were dependent upon a free-state coalition, what would happen? Since free-state coalitions are always pluralistic alliances that expand continuously, the world would ultimately be split into two opposing coalitions. This is because in the course of global unification, countries will join coalitions due to two motives. Some will form a coalition to play a leading role in unification; these countries will be extremely powerful and large in scale. Others will join a coalition to protect themselves from being marginalized in unification; these countries will be small- or medium-sized countries of less power; therefore, the coalition for global unification will be dominated by major powers and participated in by small and medium-sized countries.

Not all major powers will gain leading roles in the process of unification, and not all smaller powers can be protected from marginalization. Those countries that are unable to receive the attention and benefits they desire will be crowded out from one coalition to form another coalition; thus, the relationship between various coalitions will always be competitive and antagonistic. This is the law of coalitions. As soon as global unification becomes generally accepted and the need for national coalitions starts to arise, various coalitions will rise up. These coalitions will all try to absorb as many new members as possible in order to guarantee a leadership position in the unified society.

If no large-scale wars break out during this period, changes will start to occur as national coalitions develop. The weaker coalitions will recognize their disadvantage and be absorbed into large coalitions. Alternatively, medium-sized coalitions of similar power will choose to merge together to form a new, stronger coalition. The two abovementioned situations may take place simultaneously and complement each other.

As coalitions continue to develop and mature through mergers and acquisitions, it is likely that two superpower coalitions will emerge, each occupying half of the globe. Both of these coalitions will hope to emerge as the dominant force in the crucial historical moment of global unification, and they will be locked in opposition as a result. At the same time, during their initial and intermediate stages, national coalitions will be semi-close in nature, because most countries will have joined the coalition to avoid marginalization. In reality, they will play a very small role. The coalitions will be dominated by very few countries. The leaders and peoples of most countries will not be happy to surrender full control and sovereignty to the national coalition, so they may give up portions of power gradually. Since the national coalitions will be eager to attract more members and retain existing members, they will not insist on absolute power transference right away. It will be some time before these national coalitions mature enough to have practical significance; the earlier national coalitions will only be semi-close in nature.

The above characteristics will increase the probability of conflict between coalitions. Since each coalition will have a massive number of members, escalated confrontation may very likely occur and even lead to global war. This world war may end up pitting one half of the world against the other, and all means of high-tech murder techniques could be employed. It would be a war of truly destructive power.

We can conclude that free-state coalitions may give rise to the possibility of a devastating world war. This is obviously contrary to our goal of achieving unification through peaceful transition. Free-state coalitions, therefore, are not the best option for the transition approach.

4. Conclusion: Absolute Superiority Can Prevent Mass Murder

Since free-state coalitions can easily lead to the outbreak of devastating world war, we must avoid the emergence of pluralistic coalitions. To do this, we must first eliminate the free alliance between countries; that is, we cannot allow countries to form coalitions at will. One central, singular coalition must be formed and further expanded on according to a strict timeline and a mature plan. This coalition will systematically absorb new members until it naturally transitions into a unified society.

The key to this idea is the limitation of free unification within a country-based society. Only a few specific countries can be allowed to form one singular coalition aimed at promoting global unification. Realistically, this approach will limit partial powers of most countries. Such an act has never been tested in history, since international organizations have never been powerful enough to do so. What kind of power would it take to accomplish such a feat?

All countries in NATO take orders from the United States, and the countries of the Warsaw Pact followed the lead of the Soviet Union. Both the United States and the Soviet Union had the absolute strongest strength within their respective camps.

In the Chunqiu period (also known as the Spring and Autumn Period) of China two thousand years ago, many states of various sizes existed spread in the Huaxia area. As the might of the Zhou dynasty diminished, the five most powerful states emerged. These five states respectively dominated China’s affairs in different periods and were known as lords among their peers. At the time, many countries did not heed the orders of the Zhou emperor, but they did not dare disobey the lords of the time. This shows that strength has always been the ultimate deciding factor in a country-based society.

Although international organizations like the League of Nations and the United Nations cannot control the actions of countries, the major powers of the world can. Many smaller countries can ignore the orders of the United Nations but must bow down before larger, more powerful nations. In NATO, France and Germany challenged the authority of the United States in succession, but only because they had each gained considerable strength of their own. In the socialist camp, China challenged the Soviet Union as well and eventually withdrew from the Soviet-centric camp. This

was also because China had gained enough capital to be placed on equal footing with the Soviet Union.

Looking back on the issue of coalition pluralism, we can conclude that only an absolute power could be strong enough to prevent the free alliance of countries. Furthermore, this type of power can only come from countries. We are not speaking of one singular country; no country could possibly hold so much power. We are talking about a superpower coalition with strong political, military, and economic ties and consisting of the major powers of the world. This superpower coalition would be an uncontested giant in the world, and no other force on Earth would be able to challenge it. Even if challenges were leveled at such an entity, there would be minor resulting damage.

We know from history that any war with extreme disparities in strength will not result in large-scale casualties and losses. For example, there were only 130 casualties on both sides when the United States occupied Grenada in 1983, most of which were Cuban aid troops. The United States succeeded in occupying Grenada in only three days. In 1989, it took only four days for the United States to capture Panama and escort Panama's president, Noriega, to await trial in the United States. Only three thousand casualties resulted on both sides and more than half of them were civilians. The 1991 Gulf War was considered a large war, but even then less than twenty thousand casualties were reported. In particular, the US-led multinational force lost less than one hundred people and took only forty-two days to force Iraq to withdraw its troops from Kuwait. These circumstances were all made possible by the absolute military, political, and economic advantages of the United States relative to the other countries involved.

In comparison, the Iran-Iraq war that took place between 1980 and 1988 resulted in far greater damage. As two medium-sized countries with similar power, Iraq and Iran were embroiled in war for over eight years. The war resulted in 2.5 million casualties and nine hundred billion dollars in war expenditures. In the end, neither party conquered the other, and the only result was that two oil-rich countries became poverty-stricken.

Both world wars were also confrontations between evenly matched powers. The confrontation between the Allied and Axis powers in World War II was particularly brutal and dragged half the world into the abyss of war. These two world wars caused unprecedented damage and casualties; the destruction to culture, society, and humanity is impossible to calculate. Countless historical events illustrate one truth: evenly matched confrontations will surely lead to extremely brutal wars, but conflicts between disproportionate powers will usually avoid excessive bloodshed.

This issue can be explained in the following way. When the gap of power is extreme, not only will the weaker party be more willing to surrender and obey, but the stronger power will often feel more merciful. This is similar to how a giant may choose to spare defenseless, vulnerable children. While matched powers will inspire competitiveness, absolute superiority can often inspire kindness and a desire for peace within countries and national coalitions. In order to ensure the peace and mutual inclusiveness between countries and national coalitions, power of absolute superiority is necessary.

We can conclude that one close-knit national coalition formed by the strongest powers in the world is necessary for successful global unification. This coalition must be strong enough to deter all other countries in the world from forming alliances freely, thus changing the free state of countries. This absolutely superior coalition is the only power capable of achieving peaceful transition to global unification through one singular alliance without any destructive war. We will refer to such an entity as the "absolutely superior coalition of countries," or the "superior coalition" for short. Identifying and selecting a superior coalition is the most appropriate transitional approach towards global unification.

SECTION TWO: THE THREE PRINCIPLES

Now that we have determined that a transitional stage led by a superior coalition is the necessary and most suitable approach for global unification, our discussion should turn to the formation and operation of such a superior coalition. We believe that the superior coalition's establishment and operation strategy should conform to three major principles: the legality principle, the feasibility principle, and the justice principle. The "legality principle" refers to the coalition's conformity with international law; the "feasibility principle" refers to the smooth establishment of the coalition as well as its successful promotion of ultimate global unity; and the "justice principle" refers to the balance of interests from all regions and groups in the world while fully considering the democracy and human rights of all peoples, as well as the achievement of desired results for as many people as possible.

One: The Legality of the Strategy

1. The Legality Principle

Since the legitimacy of the superior coalition falls under the purview of international law, we must first understand the characteristics of international law.

Most people have some basic understanding of their domestic laws. We accept authority and are subject to the constraints of domestic law on a daily basis, both consciously and unconsciously. Domestic law is devised by the legislature of the state in accordance with certain procedures; it is broadly binding and its main body is comprised of all relevant persons and groups within its domain. Domestic law is upheld by institutions of the state, such as the army, the police, and the courts; thus, it is guaranteed to be effectively implemented. The scope of domestic law does not extend to other countries, nor does it involve the entire international community.

International law is also known as Public International Law; it is completely different from domestic law. The main body of international law is comprised of countries, intergovernmental organizations, and national liberation organizations seeking independence. International law seeks to mediate the relations between the abovementioned subjects. It generally does not mediate between the subjects of domestic law. International law is effective within the entire international community.

Comparative to domestic law, international law has two distinct characteristics. First, the principles and systems of international law are formulated by sovereign states and other subjects of international law in accordance with the principle of equal consultation, usually in the form of treaties, conventions, and agreements. The second major source of international law is international customs—customs that have been repeatedly applied in international practice and are generally recognized as having legal character. Second, from the perspective of law, there is no institution higher than the state that has the power to enforce international law. International law can only be enforced by the subjects themselves or through collective action.

For example, the Treaty of Westphalia established after the Thirty Years' War in 1648 was a document of international legality. The Covenant of the League of Nations also had international legality; the Charter of the United Nations, established after World War II upon the birth of the United Nations, is also a document of international legal validity. Other treaties of smaller scope have the same legality as international treaties, such as the 1815 Holy Alliance Treaty signed by Russia, Austria, and the United States. The Four-Power Treaty (signed by the United States, Britain, Japan, and France in 1921), the Sino-Soviet Treaty of Friendship, Alliance and Mutual Assistance (signed by China and the Soviet Union), and many other treaties all carry the force of international law.

According to the characteristics of international law, we can see that international law and international relations are inseparable. The latter is the basis for determining the former. Whether it is the conclusion of treaties, conventions, and agreements between countries or the international customs of international affairs, international laws are often a reflection of international relations. Therefore, it is fair to say that international law is determined by international relations.

The legitimacy of international law changes over time. Acts that were once considered legitimate may be considered illegal in other time periods, while illegal acts today may become lawful in the future. Due to the constantly adapting nature of international law and international relations, we must emphasize the following points:

First, the establishment of a new international order usually requires a major war. For example, the framework of modern international relations was established on the ruins of European feudal theocratic power of the Middle Ages. The religious reformation movement in sixteenth century Europe spread to all other countries and exerted profound influence on European society. At that time, the Habsburgs in Austria were the main defenders of Europe's feudal system, and they were in fierce opposition with the Protestant countries.

The Thirty Years' War between 1618 and 1648 started with religion, but it quickly evolved into a political war that encompassed almost all of Europe. The war ended in victory against the Habsburg dynasty. The signing of the Treaty of Westphalia marked the end of the war and the establishment of a new system of international relations. The world order of prewar Roman theocracy was completely broken, and the Habsburg dynasty was forced to recognize the sovereignty of all the vassal nations. This new system of international relations was called the Westphalian system.

Under the Westphalian system, the main participants in European affairs were Britain, France, Russia, Prussia, and Austria—until the French Revolution broke out. At that time, France was a major power in Europe, so the influence of the French Revolution on world politics and international relations was extremely far-reaching. In order to stifle the French revolution, European powers like Russia, Britain, Austria, and Prussia promoted the restoration of the Bourbon dynasty. The ensuing war with the First French Republic established by the French Revolution and then Napoleon I's First French Empire lasted over twenty years. The victors of this war rearranged Europe and established a new order of international relations. This was the Vienna system.

The Vienna system was followed by the Bismarck system. The dissolution of the Vienna system and the establishment of the Bismarck system was caused by a series of wars, including the European revolution, the Crimean War, and the German reunification war. The united Germany soon became a major power in Europe. The German prime minister, Bismarck—a manipulative diplomat and far-sighted politician—formed a new international order known as the Bismarck system. This system lasted until the outbreak of the First World War.

World War I resulted in tens of millions of casualties and led to the final disintegration of the Bismarck system and the establishment of the Versailles-Washington system.

The collapse of the Versailles-Washington system and the subsequent establishment of a new system of international relations was the result of World War II. The system of international relations formed after the war was called the Yalta system, because the commanders of the United States, Soviet Union, and Great Britain held their postwar meeting in Yalta in February 1945. It was in this meeting that the victors of World War II rearranged the postwar world order and established a new system of international relations.

Second, international relations determine the standards of international law. International relations are the foundation of international law and they determine the standards of international law. Both international treaties and international customs are a reflection of international relations. The emergence of a new system of international relations will inevitably lead to new changes in the content of international law, because the establishment of new international relations is usually ruled by a series of important international treaties and conventions. International customs are also changed as international relations adapt.

The legitimacy and justice of international law are not always the same thing. Since the establishment of a new system of international relations is generally accompanied by large-scale war, the leading establishers of the new international system must be the victors of war. As victors, they will undoubtedly put the interests of their countries first. Only after national interests are fully tended to will they take into account the interests of other countries. The victorious countries will also inevitably impose unequal conditions upon the defeated countries, and the defeated countries will be powerless to resist. All this is just common practice. These actions are certainly not fair and reasonable, yet they are legal from the perspective of international law because they have been established by means of treaties to which all parties have agreed and endorsed.

2. Seeking Legitimate Strategies within the UN System

Here we will seek an appropriate approach to the superior coalition strategy based on today's system of international relations and laws. Since the establishment of a superior coalition has never been attempted before, there is no readily formed code of conduct or case precedence. We can only formulate a suitable approach by analyzing international history and relying on logical reasoning.

The establishment of contemporary international relations and law systems stems from the Second World War. After World War II, the event of highest international influence was the establishment of the United Nations and the signing of the UN Charter. The establishment of the United Nations as a focal point in global affairs is the most prominent feature of postwar international relations. Recognition of the Charter of the United Nations as the core source of contemporary international law is the most prominent feature of postwar international law.

The UN's role in global affairs is most similar to the role the world power will play in a unified society. Considering the United Nations' role in international society and its functional similarity to the future world power, it is only natural to seek legitimate strategies for the superior coalition within the UN system. In fact, the UN has always been seen as a transitional program that brought the international society from anarchy into the possibility of world unity. This is because the functions and purposes of the UN itself are very similar to that of a world power.

At present, 193 countries are members of the United Nations, including all the major countries of the world. These countries have the obligation and responsibility to act within the UN system in accordance with the UN Charter. In fact, the scope of the United Nations and its coordination is not limited to its members but actually exceeds its members and has extensive global significance in the fullest sense. It is stipulated in the UN Charter that within the necessary range of peace and security maintenance, the United Nations should ensure that non-member states also comply with the principles set forth. As can be seen, the status of the United Nations as a mediating force is entirely global.

a. The Agencies of the United Nations

In order to seek legitimate strategies for the superior coalition within the UN system, we must first analyze the organizational structure and operational mechanisms of the United Nations. The United Nations has six main organs: the General Assembly, the Security Council, the Economic and Social Council, the Trusteeship Council, the International Court of Justice, and the UN Secretariat. A series of subsidiary organs are also located under these principal organs.

i. The General Assembly

The UN General Assembly is the main deliberative body of the UN. It is composed of all the UN members, and each country has one vote. No country can have more than five representatives on the General Assembly.

The main duties of the General Assembly are to discuss the cooperation among nations and the maintenance of international peace and security (including the principles of disarmament and arms control); to advise member states or the Security Council on the above principles; to study and promote political international cooperation; to promote the progressive development and codification of international law; to promote international cooperation in all fields of economy, society, culture, education, and health; to accept and consider reports on the work of other United Nations departments; to appoint the Secretary-General on the recommendation of the Security Council; to elect non-permanent members of the Security Council; to discuss the admission of new member states on the recommendation of the Security Council; to discuss the decision to remove member states; and to discuss and decide on the budget of the United Nations. The General Assembly discusses a wide array of issues, but it cannot discuss any issue that the Security Council is deliberating.

The General Assembly is convened and presided over by the president of the General Assembly, who is elected by the previous General Assembly. There are also twenty-one vice-presidents. The president of the General Assembly rotates regionally. The distribution of the president and vice-presidents is as follows: six from African countries, five from Asian countries, one from Eastern European countries, three from Latin American countries, two from Western European countries and other countries, and five from the permanent members of the Security Council.

ii. The Security Council

The Security Council is composed of five permanent members: China, France, Russia, the United Kingdom, and the United States, and ten non-permanent members (formerly seven non-permanent members, increased to ten in 1965). Non-permanent members are elected by the General Assembly for a term of two years and may not be re-elected successively.

The main duties of the Security Council are to maintain international peace and security, as well as to preside over and promote international disarmament and arms control. In addition, the functions of the Security Council also include: exercising the United Nations' trusteeship role, electing judges to the International Court of Justice separate from the General Assembly, taking measures to implement the judgments of the International Court of Justice, recommending the Secretary-General and new members states to the General Assembly, and recommending the suspension or expulsion of member states to the General Assembly.

iii. The Economic and Social Council

The Economic and Social Council, referred to as ECOSOC, is comprised of fifty-four members (formerly eighteen members, increased to twenty-seven in 1965 and then fifty-four in 1973). The members of the council all serve a term of three years, and eighteen new members are elected by the General Assembly every year. Re-election is possible once the term expires. The Economic and Social Council is responsible for coordinating international economic, social, cultural, educational, and health works and making recommendations in regard to these tasks. In addition, at the request of the General Assembly, the Security Council, or other UN agencies, the council

will also provide intelligence and assistance as well as hold international conferences when necessary.

iv. The Trusteeship Council

The Trusteeship Council oversees the trusteeship of territories and examines relevant trusteeship reports and petitions. The Trusteeship Council is composed of three country categories: member states administering the trusteeship of territories, permanent members of the Security Council that do not administer the trusteeship of territories, and a necessary number of Assembly-elected three-year member states. With the gradual reduction and complete disappearance of trusteeship administrators, the current board of trustees consists only of the five permanent members of the Security Council.

v. The International Court of Justice

The International Court of Justice is set up to deliberate and deal with international legal issues and to settle international disputes through judicial means. It is composed of fifteen independent judges of different nationalities. These independent judges are elected by their respective countries and then selected through a series of specific procedures.

The International Court of Justice has judiciary functions and advisory functions; it does not accept cases from individuals. Once the court passes judgment, if one party chooses not to comply, the other party can ask the Security Council to enforce the judgment. The advisory function of the International Court of Justice mainly includes advising the General Assembly and the Security Council on legal issues at any time. Other United Nations agencies—if authorized by the General Assembly—may also request the International Court of Justice to issue an advisory opinion on legal issues within its scope.

vi. The UN Secretariat

The UN Secretariat is the administrative organ of the United Nations and is comprised of one Secretary-General, one Deputy Secretary-General, several Assistant Secretary-Generals, and other administrative staff. The Secretary-General is recommended by the Security Council and appointed by the General Assembly for a term of five years; they can be re-elected. The Secretary-General is the chief administrative officer of the United Nations; they manage and oversee the work of UN staff and exercise the authority as well as fulfill the responsibility of the Secretary-General in all the principal organs of the United Nations.

b. The UN's Core Authority Lies in the Security Council

The voting systems of the United Nations fall into three broad categories: "one-country, one-vote" consensus, "one-country, one-vote" majority, and "one-country, multi-vote" weighted system.

The one-country, one-vote consensus refers to a system in which each country has one vote and all resolutions require unanimous consent to pass. The unanimity principle of the Security Council relies on this type of voting system; it gives every member state the same right to veto.

The one-country, one-vote majority refers to a system in which each country has one vote but all resolutions only require majority vote to pass. This system can again be divided into simple majority and specific majority. The former only requires more than half of the votes to pass, while the latter may need a specific majority—like 2/3, 3/4, 4/5, and so on—to pass. The UN General Assembly as well as most of the specialized agencies of the United Nations relies on the one-country, one-vote majority system.

The one-country, multi-vote weighted system refers to a voting system that allocates votes to countries according to specific parameters like responsibility, contribution, and other conditions. This may result in unequal distribution of votes among different countries.

Among the organs of the United Nations, the two most important are the General Assembly and the Security Council. The General Assembly is the supreme organ of authority designated by the UN Charter; the Security Council is the sole authority that can make and implement decisions for all member states of the UN. The resolutions of the UN General Assembly are not universally binding; only the resolutions of the Security Council carry true compulsory force. Therefore, the core authority of the United Nations lies in the Security Council, not the UN General Assembly. The Security Council is the most important implementing agency of the United Nations.

In order to join the United Nations, a country must first be recommended by the Security Council and then its membership will be discussed and voted on by the General Assembly. Similar procedures apply to members who have been suspended or expelled. When it comes to issues being discussed by the Security Council, without express request from the Council, the General Assembly cannot discuss the same issues. When judgments of the International Court of Justice are not executed, complaints and implementation requests are submitted to the Security Council, not the General Assembly. The General Assembly only has advisory power when it comes to the maintenance of international peace and security, but the Security Council has the authority and power to make concrete decisions.

The Security Council's powers are not only extensive but also superior to all else. In fact, the powers of the Security Council far exceed the parameters stated above. The Security Council is also responsible for formulating disarmament and arms control programs; exercising the UN trusteeship functions; selecting judges to the International Court of Justice; recommending the Secretary-General to the General Assembly; suspending or expelling the rights of member states; participating in amendments to the UN Charter; and other responsibilities.

The above details are enough to demonstrate that the power of the United Nations lies in the Security Council. As a universal representative, the General Assembly acts like a world forum; it's comparable to how a parliament would function in a country. Meanwhile, the Security Council functions like the government that holds actual power.

The core power of the Security Council lies in its five permanent members: the United States, China, Russia, Britain, and France. However, every member on the council—permanent or temporary—has one vote. All procedural matters require nine out of fifteen votes to pass, while non-procedural issues require "yes" votes from all nine temporary members and consent from all five permanent members—that is to say, every permanent member of the Council has veto power. However, if permanent members do not participate in voting or abstain their vote, it does not constitute a veto.

It is worth noting that all permanent members also have the right to decide whether or not an issue is procedural or non-procedural. They can exercise their veto power if they decide that an issue is not procedural and must be voted on accordingly. This means that all permanent members actually have "dual-veto" power. The essential implication of this dual-veto power is that every permanent member of the Security Council has the power to directly or indirectly veto any issue.

The Charter of the United Nations bestowed extraordinary power upon the Security Council and also empowered the five permanent members of the Security Council, so UN affairs are generally dominated by these five permanent members. This is the reality of the United Nations; it may not be reasonable, but it is legitimate.

3. Specific Approaches

Since the centerpiece of contemporary international relations is the UN system, the core source of international law is the UN Charter. When formulating a design for the superior coalition, we can rely on the UN Charter as a guideline to determine the members that will make up this coalition.

First Inference: The power structure of the superior coalition should mirror that of the UN

In order to establish a legitimate superior coalition, let us first examine the functions and powers the coalition should possess.

The superior coalition should lead all mankind toward global unification (i.e., it should play a leading role in the transition to a unified society).Although countries will still remain in the transitional period, their sovereignty will not be complete. Portions of their power will have been transferred to the superior coalition; thus, all countries will have to follow the lead of the superior coalition.

What kinds of principles must the superior coalition be based on in order to be in conformity with the principles of international law? Since there are no precedents in the history of humanity for the establishment of a superior coalition, it is impossible to obtain provisions from existing international law. We can only determine some possible principles by analyzing the basic principles of current international relations and international law.

One thing is certain: one of the most crucial legal challenges will be the determination of which countries are most qualified to lead the world. In other words, which countries would most deserve to be chosen to form the superior coalition?

The only existing organization that can be compared to the superior coalition is the United Nations. According to the UN Charter, the powers conferred on the United Nations by various countries are manifold. The primary power of the UN is aimed at the maintenance of world peace and stability. In this regard, the United Nations can take all measures to ensure world peace, even armed force when necessary. At the same time, the United Nations shoulders the responsibilities of promoting international cooperation, promoting the development of human society, and safeguarding human rights. Its covers almost all major areas of politics, economics, military affairs, culture, and society. In theory, the scope of the United Nations extends to the world, which is consistent with the scope of the superior coalition.

Since the United Nations is an international organization, it is different from the superior coalition in two ways. First, the United Nations is not as powerful as the superior coalition due to a lack of its own global army. Comparatively, the superior coalition will have overwhelming military capabilities and will be able to exercise its powers to a far greater extent than the United Nations.

Second, the power of the United Nations is not as in-depth as the superior coalition's will be. For example, the United Nations cannot interfere in the internal affairs of countries and must recognize the independence and sovereignty of nations. The same does not apply to the superior coalition. In the transitional period, countries will be required to transfer some of their power to the superior coalition in order to better facilitate the transition to a unified society. Without at least claiming some parts of each country's sovereignty, it would be impossible for the superior coalition to command global affairs.

We can make the following approximations based on the above two points:

First, the superior coalition will increase the power exercised by the United Nations. The inability of the United Nations to properly exercise its power when needed is a fatal flaw, and the superior coalition will rectify this flaw. Therefore, the superior coalition will be more conducive to the fundamental interests of all mankind. We can conclude that the superior coalition will acquire power in the same way as the United Nations, but the former will exercise its power more effectively. This is in accordance with the principles of international law.

Second, the United Nations possesses some powers to safeguard the fundamental interests of mankind. These powers are endowed by the UN Charter, which is an extensive multilateral agreement signed by all member states; therefore, the power of the United Nations is in fact gained by willful transfer from member states. The superior coalition will gain power in the same way, only on a deeper scale. Since the prevention of human extinction is of highest priority, it is in accordance with international law that countries transfer more of their power to the superior coalition to facilitate global unification.

Second Inference: The superior coalition should be modeled on the framework of the Security Council.

When designing the superior coalition based on the United Nations, the following two elements must be considered:

First, sovereign states voluntarily confer their power to the United Nations by signing the UN Charter. (The principle of national independence and sovereignty is very important to contemporary international law.)

Second, only the member states of the United Nations sign the UN Charter—that is, members only surrender part of their sovereignty when they wish to become a part of the United Nations.

Members of the superior coalition will be very limited in number; it may be a few or a dozen at most. There are more than two hundred countries in the world, which means that 90 percent of the world's countries will not be included in the initial superior coalition. The majority of countries will undoubtedly be unwilling to hand over their sovereignty to a superior coalition comprised of few member states. Even if a document similar to the UN Charter were signed, there would be no guarantee that the treaty would be signed willingly by all parties; thus, the ensuing acquisition of power by the superior coalition would be illegitimate.

In order to solve this issue, we must first discuss the institutional framework and distribution of power within the United Nations. Among the various agencies of the United Nations, the UN General Assembly is the symbol of supreme authority. The General Assembly is composed of all member states, and all members have the right to one equal vote; however, it is impossible for such a vast number of countries and their representatives to exercise substantive power in such a large assembly. In fact, the resolutions of the UN General Assembly are not even universally binding. Among the UN agencies, it is the Security Council that holds true authoritative power. The Security Council is composed of a very small number of members, yet its decisions are final and binding upon all members of the United Nations. From this we can reason that the Security Council holds the true power to represent the United Nations in leading the actions of the world.

With the above reasoning, the establishment of the superior coalition can be easily solved. Since the Security Council has the power to represent the United Nations on a global scale and it is composed of a small number of countries, the superior coalition should be modeled on the framework of the Security Council. In other words, in order for the superior coalition to have international legal basis as well as effectiveness, it should be established according to the compositional characteristics of the Security Council.

Based on the above conclusions, we may further examine the representative nature of the Security Council to determine its suitability as a precedence for the superior coalition.

We know that the Security Council is composed of fifteen countries: five permanent members, and ten non-permanent members. These countries are among the largest and most powerful countries in the world. They are also countries of global representative power.

Among the six major organs of the United Nations, the Security Council and its members hold core power. In fact, the power of the Trusteeship Council belongs to the five permanent members of the Security Council as well.

There are fifty-four members in the Economic and Social Council. Since the members of the Security Council are all major players on the world map and generally hold membership within the ECOSOC as well, they also hold great influence in the Economic and Social Council.

Within the General Assembly, not only do the members of the Security Council all hold their own seat, but the five permanent members are also guaranteed fixed vice-president positions. This is a deliberate special arrangement made in concession to the permanent members of the Security Council; no other country receives similar privileges. In addition, the non-permanent members of the Security Council are also important countries in the world and have the potential to become president or vice-president of the General Assembly.

Even without the non-permanent members of the Security Council, the five permanent members of the council alone have considerable power and prestige in the United Nations. It is safe to say that they can decisively influence most of the countries in the General Assembly on any topic or resolution.

The fifteen independent judges of the International Court of Justice are elected through an absolute majority vote by both the General Assembly and the Security Council. This means that the Security Council can veto any judge selection they disagree with. Moreover, all five permanent members of the Security Council will usually each have a judge of their own in the International Court—making up more than one third of the judges.

The Security Council can also recommend the appointment of the chief administrative officer of the United Nations—the Secretary-General. The Secretary-General is essentially handpicked by the Security Council.

We can see that the Security Council not only holds the core power of the United Nations but also has the ability to influence the other organs of the UN. It has decisive power on the decisions and actions of the United Nations. The governing bodies of the Security Council more or less make up the full controlling power of the United Nations, making them great candidates for a legitimate superior coalition.

Should the superior coalition be composed exactly like the Security Council? That is, should the number of countries be five (permanent members) plus ten (non-permanent members)? That is not necessary from a theoretical point of view.

In the decision-making process of the Security Council, all procedural decisions require nine "yes" votes, while non-procedural issues require the five permanent members to not exercise their veto power in addition to nine "yes" votes. If all five permanent members reached consensus, further consent from only four non-permanent members would be required to pass a resolution.

A superior coalition is comprised of countries, but once these countries join the coalition, they will integrate and cease to be independent nations. We can hypothesize that all decisions of the superior coalition will be unanimous.

From this perspective, nine countries with sufficient representative power will be enough to form a legitimate superior coalition. Such "sufficient representative power" should be analogous to the representative power of the members of the Security Council. The five permanent members of the Security Council will be de facto members of the superior coalition. After this, only four more members will be required to establish the superior coalition. This condition can be called the "5 + 4 condition"; that is, four more suitable countries plus the United States, Russia, China, Britain, and France.

Of course, other conditions must also be considered in the establishment of the superior coalition. The 5 + 4 condition is merely the minimum standard. If the reasonable addition of members would further the function of the superior coalition, it should be considered.

Two: The Feasibility of the Strategy

It is not enough to discuss the legality of the superior coalition; the feasibility must also be considered. We must consider whether a superior coalition can be established, and whether it has sufficient strength to lead the world towards unification.

In order to make the superior coalition feasible, the following factors should be established:

1. The Number of Countries in the Superior Coalition

Needless to say, the fewer the number of countries in the superior coalition, the easier it will be to form and integrate because religious and ethnic conflicts, as well as living conditions disparities and economic differences, will be less intense with a smaller number of countries. This will make negotiations and integration less chaotic.

At the same time, the number of members in the superior coalition cannot be too small. If numbers were too small, the superior coalition will not have broad representation and will lack necessary strength. There are a number of very powerful countries in the world today. These countries must be absorbed into the superior coalition, both for the advantage of the coalition and to prevent them from becoming threats to the coalition. If these countries formed alliances of their own independent of the coalition, they would undermine the leadership position of the superior coalition.

The number of members in the superior coalition cannot be too large or too small. From the aspect of feasibility, as long as it does not affect the formation and integration of the coalition, we should err on the side of more rather than less.

2. The Economic Scale

The economic scale of coalition member states should be as large as possible, since economic strength will always be the foundation of any country or organization. Since it would be impossible for the superior coalition to absorb too many member states, every member state will have to possess maximum economic strength.

3. Territory and Resources

Broadly speaking, territory and resource problems are essentially the same issue—that is, a resource issue. Territories are also a type of resource, but the concept of resources includes a wider range of components like oil, iron ore, coal, water, and forests. Some countries may be small but resource-rich, while other countries may be vast in territory but scarce in resources. It is difficult to analyze the resource situation of a country; for the sake of simplicity, we will use territory as the standard.

We adopt this simplification for three reasons: first, territory is generally proportional to the total amount of resources; secondly, resource situations may change day by day (before the discovery of oil, the Middle East was a barren desert); thirdly, the importance of territorial areas often transcends the concept of resources (from a military strategy point of view, a vast territory means superior military advantage). Therefore, the criterion of territory is enough to summarize the issue of resources as well as the further issue of strategic advantage. This makes territory a good standard to judge the strength of member states against.

The contiguity of territory is also an important factor to consider when discussing territorial issues. In other words, we should not only try to select countries with large territories, but we should also consider the integration potential of all member states. If the members of the superior coalition were distributed all over the globe, it would be difficult to maintain effective governance and management.

Many other conditions must also be considered in the choice of member states. If it is necessary to choose a country whose territory is distanced from other members, it should be in one or few isolated incidents. The main body of the superior coalition should be closely linked territorially.

4. Military Strength

There will be no guarantee for peace without absolute superior military strength. The superior coalition will only be able to dominate the world and lead other non-member countries through absolute military strength. Military strength will be an important criterion when judging the selection of coalition member states.

5. Consistency of People's Living Standards

The consistency of people's living standards refers to the idea that the member countries of the coalition should have similar average living standards among their citizens. If living standards were too far apart, there would be large differences between people's lifestyles, education levels, and behaviors. This would make social integration very difficult and global governance largely ineffective.

It is impossible to expect completely equal living standards among the people of all member countries. In fact, living standards within a single country are often uneven. In China, the per capita income in Shanghai is nearly four times the per capita income in Guizhou. This gap cannot be underestimated, and it brings many social problems with it. However, the social stability of China is still relatively good among the countries of the world.

The gap in living standards should be considered in conjunction with many other factors. Though we wish to strive for as small a disparity as possible, we must admit that there is a huge gap in the living standards of different countries. As long as this gap is smaller than ten times, it should not affect integration too much. If handled properly, even large living standard gaps can be overcome. When calculating the per capita living standards of countries, the more scientific "purchasing power parity" should be the standard.

6. Religion and Ethnic Extremism

In today's world, religious and ethnic extremism often lead to social instability. Terrorism emerged as a by-product of extreme religious fanaticism and ethnic sentiment. The extremely exclusive and vindictive nature of religious hatred and ethnic extremism makes them both highly incompatible with the spirit of global unification.

Ethnic and religious extremist countries should not be considered as initial members of the superior coalition, but that does not mean that they will be indefinitely excluded. After the superior coalition is established, the coalition will guide all other countries to constantly improve in accordance with the requirements of unification. Such guidance will include policies that downplay religious and ethnic beliefs and promote abandonment of extremist policies. Once this transformation attains a certain level of maturity, former extremist countries will be safely absorbed into the coalition.

Three: The Justice of the Strategy

The justice factor refers to whether the formation of the superior coalition can reflect the principle of fairness and reasonableness as well as give equal opportunities and power to all regions and groups of the world. Further analysis shows that the key component of the justice factor lies in the broad representative power of the superior coalition. Only through broad representation can the members of the superior coalition fully reflect democracy and human rights. Broad representation will also establish a broad basis of support and ensure that all countries will be willing to accept

the leadership of the superior coalition. What elements should be considered when determining the justice factor?

1. The Number of Countries and the Population Mass

Undoubtedly, the superior coalition will have most extensive justice if it encompasses all the countries of the world; however, this would be extremely difficult to achieve in the initial transitional period. In fact, it is more in line with the ultimate goal of the unified society. Conversely, if the superior coalition were only composed of one country, its breadth of representation and justice level would be abysmal. In essence, this would be the beginning of a vast hegemonic world dictatorship instead of a coalition.

In terms of formation difficulty, the former approach is definitely the hardest, while the latter is the easiest; however, both of these approaches are extreme methods that will not produce desirable results. Under the principles of legality and justice, it will only be reasonable and realistic if an appropriate number of representative member states are selected for the coalition.

In terms of population mass, the more the population is represented by the superior coalition, the better the coalition's representative power will be. A coalition that represents a great population will not only have broader representation but also a greater degree of confidence. Countries accustomed to equating population with power will feel less resistant to being led by a coalition with great population mass; thus, coalition member countries should have the largest possible populations.

2. Ethnic and Racial Issues

The superior coalition must have broad representation in all aspects, including ethnic representation. There are more than ten thousand ethnicities in the world, and it would be unrealistic and unnecessary to include every ethnicity in the superior coalition. Since the racial issue is simpler than the ethnic issue and it encompasses ethnicity, we can consider the broad representation of ethnicities through racial representation.

Generally speaking, the races of the globe can be divided into white, yellow, and black—that is European, Mongoloid, and Equatorial. These three racial categories are distributed among various countries around the world. If we use race to substitute ethnicity when considering broad representation, the issue can be simplified.

When incorporating member countries, the superior coalition must ensure that each of the three races occupies a majority position in some of countries selected. The member countries in the coalition cannot be dominated by one or two races.

3. Geographical Representation

The world is divided into Asia, Europe, Africa, North America, South America, and Australia. Geographical representation is an important component of broad representation within the superior coalition.

Every continent is home to different people. Different geographical characteristics determine the different ethnic statuses, living conditions, cultural backgrounds, and historical developments of various peoples. Geographical sentiment is a force that cannot be neglected; the collective resentment of one continent would hinder the progress of the superior coalition far more than resistance from a small or medium-sized country. Moreover, geographical representation is an integral part of global justice. As a leader in human justice, the superior coalition should choose member countries based on fair and reasonable geographical representation.

4. Religious Representation

Religion is an important form of spiritual support for all mankind. There are more than one hundred thousand religions in the world today, most of which are newly emerged religions. Three of these religions are widely acknowledged to be global religions: Christianity, Islam, and Buddhism. Even though some religions are not global, they are still large in scale and widely influential, such as Hinduism and Judaism. Religions are often divided into many branches, such as the Catholic, Orthodox, and Protestant factions of Christianity, or the Shiite and Sunni factions of Islam.

The superior coalition cannot possibly represent all one hundred thousand religions of the world due to its small number of member states; thus, we need only consider religions of wide influence when discussing religious representation. The members of the coalition should subscribe to the main religions of the word, but religious extremists should not be considered due to their exclusive nature. Among the major religions, it is only natural that the three major global religions be included first.

The spiritual significance of religion makes it a very important component of broad representation. Suitable religious representation can unite different peoples and effectively avoid conflicts and killings caused by religious hatred. Exceptional religious representation is necessary to establish a stable external environment for the effective leadership of the superior coalition.

Four: Rethinking the Plan for Unification

Previous elaboration designates the United Nations and the UN Charter as the most legitimate, feasible, and just model for developing a superior coalition. This approach is possible, but it will require consensus and sacrifice from all mankind as well as the abandonment of various differences across the globe.

I believe that humanity would be able to unite and overcome all above differences if aliens invaded Earth today. That is because the overall threat to human survival would be visible and straightforward in such a case; however, human extinction from the continued development of

science and technology is much less visible and may not even happen within our generation; therefore, global unification may take more time and effort to achieve. That is why we are adopting a method of peaceful transition as our ultimate strategy. Of course, it is still the author's personal wish that unification can be achieved in one step through peaceful means.

SECTION THREE: TWO POSSIBLE SCENARIOS

Here we will set out two possible scenarios for unification based on the theoretical principles elaborated above. Both of these scenarios are arrangements for peaceful transition. It must be noted that these two scenarios are merely envisaged approaches; they are not the only options—we are discussing them as points of reference. The most important part of peaceful transition will be the political negotiations between major powers. The attitudes of major global leaders will be the deciding factor for our final approach.

One: Scenario One: Core Country Transition

1. The Basic Idea

The basic idea for the core country transition approach is to unite the major powers in the world to form a superior coalition in accordance with the three major principles of legality, feasibility, and justice. This superior coalition should move from loosely bound to close-knit in quick succession, resulting in one closely integrated entity that functions like one country.

This superior coalition should become a country with special significance. It should have a relatively fixed jurisdiction and population; unified authorities, policies, and decrees issued by relevant centralized agencies; and it should be able to exercise full unified administration.

This "country" will be distinguished from the average country by the great mission upon its shoulders—that is, leading human society into global unity. It must continuously absorb new, mature countries to expand its reach; it must compel and supervise the limitation of science and technology development across all countries; it must coordinate the economic, social, and cultural development of the world; it must also establish political, economic, social, and cultural systems for the future unified society. This country must be the standard for the whole world and the leader of all nations.

We will call this country the "core country," delineating it to be the center figure and leader of the world. All countries outside of the core country will be known as ordinary countries. Ordinary countries will all have a certain amount of national sovereignty, but they will have an obligation to obey the unified leadership and policies of the core country on the subject of unification.

The unity of the core country will be guaranteed through a core country constitution and a strong national mechanism. The parliament, courts, army, and police of the core country will all be crucial tools to ensure its stability and long-term unity. Though the core country will have evolved

from the concept of the superior coalition, it will have discarded the characteristics of a coalition and will function more like one unified country.

As an absolute and powerful nation, the core country will be tasked with the responsibility and obligation as well as corresponding authority to lead the world towards unification. Many of the decrees and policies of the core country will have compulsory administrative power; ordinary countries should and must obey them.

The establishment of a core country does not signal the realization of the unified society but is merely the first step in the right direction. Much work will remain after the core country is established, and a further period of transition will still be necessary. During this transitional period, ethnic, religious, linguistic, social, economic, cultural, and artistic issues as well as people's living habits and moral values will be integrated further. Once such integration reaches maximum maturity, the time for unification will come.

2. The Specific Plan

According to the principle of legality, we know that the minimum standard for the core country will be the 5 + 4 condition. This has established the basic framework for the core country's makeup.

a. Analysis of the Five Major Countries

The feasibility factor focuses on the overall strength of core country members. As the five most powerful countries in the world, the five major countries undoubtedly pass this test; however, the power of these five countries alone is not enough—the other most powerful countries of the world should also be absorbed.

The element of justice focuses on the question of broad representation. The five major countries as well as the other members of the core country must satisfy a broad range of representation. First, we should examine the representation of the five major countries.

There are four representative indicators for the principle of justice: population, race, geography, and religion. In terms of population, the total population of these five countries is estimated to be nearly two billion, which is a sufficiently large number; therefore, we will focus on the other three indicators in the following discussion.

i. The United States

Race: more than 10 percent black, a portion yellow, but overwhelmingly white (80 percent)

Geography: The United States can represent North America.

Religion: Americans are mainly Protestant or Catholic Christian. In order not to complicate matters, we will not subdivide religious denominations; therefore, the United States represents Christianity.

ii. Russia

Race: white

Geography: Russia spans Europe and Asia, but its political and economic center as well as its main population are all in Europe; therefore, Russia will represent Europe.

Religion: Russians mainly subscribe to Orthodox Christianity, which is a branch of Christianity; therefore, Russia will represent Christianity.

iii. China

Race: yellow

Geography: Asia

Religion: 90 percent of Chinese citizens are atheists, and China is a country that has been relatively apathetic towards religion throughout history. However, China is one of the main centers of Buddhism, and though Buddhists account for a small portion of the Chinese population, the overall number is still large due to China's huge population; thus, China can represent Buddhism.

iv. The United Kingdom

Race: white

Geography: Europe

Religion: 80 percent of British people are Protestants, while others are mostly Catholic; thus, the United Kingdom represents Christianity.

v. France

Race: white

Geography: Europe

Religion: Christianity

To summarize, apart from China, which represents the yellow race, all four other countries represent the white race. There is no country to represent the black race. Geographically, Africa, South America, and Australia are not represented. Religiously, Islam does not have a representative among the five major countries.

b. Choosing Other Member States

According the to the 5 + 4 condition, once the five permanent members of the Security Council have been granted candidacy, we must choose four more countries to satisfy the legitimacy of the core country. In order for the core country to have truly wide representation, all the most powerful countries of the world must be considered.

After our previous analysis of the five major countries, we found that racially, there is no country to represent the black race; geographically, Africa, South America, and Australia are not represented; and religiously, Islam does not have a representative.

In order to satisfy the need for justice, the above missing elements must be accounted for. At the same time, feasibility must also be deliberated, and manageability and integration difficulty must also be taken into consideration. Specifically speaking, the territorial continuity, living standard gap, as well as ethnic and religious status of countries must be considered.

In terms of territorial contiguity, it would undoubtedly be ideal for all member countries to be geographically connected; however, simple analysis would show that this ideal situation is not compatible with the need for broad geographical representation. The continents of South America and Australia are already far removed from the territories occupied by the five major countries. In light of this, we will strive for the territories of the core country to be mostly connected but allow for a few overseas territories.

With regard to the differences in people's living standards, a percapita income gap of more than ten times will make integration very difficult; however, this tenfold limit is merely an estimation based on experience and is not conclusive. If we are to apply the tenfold limit, we should use the highest percapita income among the five major countries as the standard.

Whether or not the religious and ethnic status of a country is too extreme cannot be measured by specific indicators, so we must rely on comprehensive analysis and universal assessment from the international community.

From the above analysis, we can draw some initial conclusions regarding the selection of additional core country members. The countries selected should have corresponding representation in all aspects without affecting the efficient governance and integration of the core country. Countries with strong national power should also be considered, even if they do not have strong representational power. Exclusion of such countries would not only damage the overall strength of the core country but would also present a threat to global governance.

Two: Scenario Two: World Federation Transition

1. The Framework

Similar to the core country transition approach, the world federation transition approach will also rely on the United Nations and the UN Charter as a basic framework; however, the world federation approach will implement the principles of democracy and human rights more thoroughly. The thought process for the approach is as follows.

The world federation will maintain unified management of the world during the transitional period. Under the federation government, the world will be separated into one central state and a number of autonomous states. The central state will be comprised of the strongest countries in the world, while the autonomous states will be evolved from all other countries. Thus, the central state will essentially be a superior coalition formed to promote unification.

The central state must be comprised of the strongest countries in the world in order to grant the federation government sufficient strength and authority for world governance. According to the three major principles of legality, feasibility, and justice, the constituents of the central state should be the same as the members of the core country.

The other countries in the world will all evolve into autonomous states. These states differ from countries in that they will surrender some of their sovereignty to the world federation government. Their territory and population will remain intact, as will a certain degree of regional management authority.

The world federation approach takes into account the enormous differences in the world and the ensuing need for separate development, which is why it will retain the regional and population statuses of existing countries by transforming them into autonomous states.

During the world federation transitional period, the world will operate under a unified constitution. The world federation will be required to govern global affairs in accordance with this constitution. As time progresses, the federation government will absorb the different autonomous states into the central state according to their levels of maturity. The number of autonomous states will dwindle until there is only one central state left—that is when the unified society will be born.

The world federation approach will embrace democracy more than the core country approach. The world federal government envisaged here will adopt the democratic structure universally recognized in the world today—that is, the separation of powers. Executive power, legislative power, and judicial power will be independent and mutually restrictive of each other. Moreover, the world federation government will adopt dual levels of power separation. Not only will the federation government separate its three branches of power, but it will also separate power between states. Under the administration of the federal constitution, each state will have its own executive, legislative, and judicial branches.

a. The World Federation Government

The executive power of the world federation will be in the hands of the world federal government (hereafter referred to as the "federal government"). The heads of the federal government (federal leaders) will hold the highest federal executive power in the world. These federal leaders should be a committee of three to seven people. (The author is more inclined towards a committee to better avoid dictatorship.)

The federal government will have two major management responsibilities. The first one will be to directly govern the administrative affairs of the central state. At the same time, the highest goal of the federal government will be to lead the world towards unification. Therefore, harmonizing and balancing the world development will be another important task of the federal government.

During the world federation transitional period, the world constitution will give each autonomous state considerable autonomy and the federal government corresponding administrative leadership. The federal government will exercise its authority in accordance with the provisions of the world constitution. Federal leaders will be the chief administrators of the central state as well as the chief commanders of the unification movement. They will be the heads of both the federal government and the central state government.

b. The World Federation Parliament

The World Federation Parliament (hereafter referred to as the "federal parliament") will be the legislative body of the world federal government. In theory, the federal parliament will be the supreme power of the world federation. The laws promulgated by the federal parliament will set the code of conduct for the entire world, including the federal government. The federal courts will also be governed by the laws promulgated by the federal parliament.

The composition of the federal assembly should fully reflect the principles of democracy and human rights. The members of the federal parliament should be elected and dispatched by the various states.

Since the central state will be comprised of the most powerful countries of the world, it will take up a great portion of the parliament based on population ratio. Autonomous states evolved from smaller countries may not even receive one parliamentary seat, depending on their population. However, all states should have the right to express their own opinions and represent themselves; thus, the distribution of parliament members should lean in favor of the autonomous states.

In addition to formulating and voting for various laws and resolutions, the members of the federal parliament should also participate in the election of federal leaders. Since the members of the federal parliament will all represent their own people, their election of federal leaders will be a universal manifestation of democracy and human rights for all.

The federal parliament should also represent the people of the world to supervise and comment on the federal government's administration as well as debate and justify major policies and decrees. If a fair percentage of votes can be reached, the federal parliament should also have the power to impeach certain unsatisfactory federal leaders.

Apart from the world federal parliament, all states should have their own parliaments as well. The federal parliament will be responsible to the people of the world, whereas state parliaments will be responsible to the people of their state. Federal leaders will be supervised by both the federal parliament and the central state parliament.

c. The Supreme Court of the World Federation

The Supreme Court of the World Federation (hereby known as the "federal court") will be the judicial body of the world federal government. Its main duty will be to safeguard the cause of unification from a judicial level. It must ensure the purity of the world federation in the transitional period; ensure that the responsibilities, rights, and obligations granted to all states by the world constitution are implemented and fulfilled; and it must safeguard the world constitution itself.

The federal court will not accept litigations from within the states, as that will be the jurisdiction of state courts. Cross-state civil and commercial disputes will be handled by special judicial departments, not the federal court.

Half of the judges on the federal court will come from the central state, and the other half will be selected from autonomous states. This will ensure that the rights of the autonomous states be well represented along with the rights of the central state.

The federal court will have the power to interpret the federal constitution and declare certain acts as unconstitutional. The federal court will also accept lawsuits concerning unconstitutional actions.

2. The Election of Federal Heads and Parliament Members, and the Manifestation of the Principles of Democracy and Human Rights

The leaders of the federal government will hold the highest federal executive power in the world, so the universal and democratic election of these leaders will be the most important indicator of the federation's justice. In order to properly design the democratic election process of federal leaders, let us first analyze the power characteristics of the federal leaders.

It has already been stated that the federal leaders will directly govern the central state and rely on the strength of the central state to lead global affairs; therefore, federal leaders will have some degree of control over the autonomous states and they will be the highest commanders in all matters of global unification. Federal leaders are not only responsible to the central state and the

federal government, but to all the autonomous states as well. In this respect, all autonomous states should have the right to elect federal leaders.

We may propose the following design as a specific voting procedure. The central state will first conduct internal discussion and vote on candidates; the candidates with the highest votes will be recommended to the parliament and voted on by all members of the parliament. This means that the final decision of federal leaders will be made by the federal parliament, not the central state.

Since the representatives of the federal parliament are determined by population ratio in favor of autonomous states, the central state will receive no privileges in the parliament. The representatives in the parliament will all vote in the interests of their own people, so the final vote should largely reflect the will of the general population. Theoretically speaking, this will be a democratic election of the people.

The representatives of the federal parliament will be decided by each state. Each state may use their own historical traditions to determine the procedures for representative election. Representatives will be selected according to state legislature, not federal policy.

As representatives on the federal parliament, members will not only elect federal leaders on behalf of their people, but they will also exercise a series of other legislative, political, and supervisory powers in the context of global affairs. The world federation transition will take into consideration the multifaceted rights of all peoples in the world; it will be a true manifestation of democracy and human rights.

Chapter Eleven The Ideal Unified Society

The original intention for proposing and establishing a unified society was for the overall survival of mankind; however, establishing a unified society to limit the development of science and technology and ensure the continued survival of mankind is only the first step. The ideals of mankind far exceed the survival instinct. As intelligent and civilized beings, mankind also has demands of happiness, enjoyment, pleasure, and so on. The social system of humanity should fulfill and maximize all values of humanity.

As a brand-new social system, the unified society will have no precedent in human history. This not only indicates the numerous challenges that we may face, but also the beautiful possibilities offered by a blank slate. Without the heavy burden of history, we can design and create a most ideal society for humanity.

SECTION ONE: THE OVERALL VISION OF THE UNIFIED SOCIETY

From today's point of view, the unified society should be the ultimate social form of human society. It is the only social form that can limit science and technology development and save humanity from extinction. At present, humans are still not fully rational when it comes to the use of science and technology; perhaps we may reach this state one day through further evolution. If that day does come, the conclusions of this book will no longer be necessary. Although we sincerely hope for such a miraculous occurrence, the lengthy time required for advanced evolution makes such a situation difficult to hypothesize.

Our design for all aspects of the unified society should be based on one starting point: the unified society should not only prevent human extinction, but also be an ideal society that meets all the needs of mankind. The unified society will no doubt extend for hundreds of millions of years, longer than all previous human history. We cannot suppose that the needs of future generations will be the same as they are today, so the unified society will always be subject to adaption and change.

All of our research on the unified society will be based on a contemporary perspective. Our conclusions will be based on the methodological systems and values universally accepted today. We may only establish a framework for the idea; as conditions of humanity and human society change, its content will change accordingly.

One: A New Non-Competitive Society

In order to establish the unified society as an ideal society, we must first determine the concept of the ideal society. We will hypothesize that a society whose system is in conformity with the principle of maximum value (Chapter Two, section two) is an ideal society. This tells us that from the perspective of all mankind, a society in which the greatest possible number of people can realize the greatest possible values is an ideal society.

The values of survival and happiness are the most important human values, and the overall survival and happiness of humanity is especially important. In order to design an ideal society, we must first consider the issue of overall human survival and then contemplate the subject of universal happiness.

The transformation of human society from a country-based society into a unified society is in consideration of overall human survival. This is the only option that can restrict scientific and technological development and prevent human extinction. The main momentum for extreme science and technology development is the competitiveness of countries. Countries will take all actions necessary to maintain a competitive advantage in the fiercely competitive international environment. For example, countries will mobilize the competitive enthusiasm of enterprises to improve labor productivity and innovation; countries will encourage schools to produce more research results and more talented personnel; countries will motivate all members of the nation to work towards improving national strength. Since every country will act in these ways, the entire human society will be enveloped in a competitive atmosphere. That is why human society has become the competitive society it is today.

A competitive society not only threatens the overall survival of mankind but individual and group survival as well. War and terrorism are all such examples. They were all results of political, ethnic, or religious competitions that led to massive loss of life.

A competitive society is also very damaging to the happiness of all people. Today's historians generally agree that our ancestors were happier than we are. Even the people in the late Paleolithic age were happier than we are today. People at that time were more easily satisfied and had ample time for entertainment.

Today's society has become increasingly competitive. With the explosion of knowledge, people are under constant pressure to learn more every day. A culture of comparison has also formed in this competitive environment. People compare their education, wealth, and social status, and as a result, no one is ever satisfied. At the same time, due to frequent competitive social wars and vicious crimes, people must constantly bear the pain of loss, both physically and emotionally; therefore, it is hard to find happiness in a competitive society.

Competition brings harm to human values in multifaceted ways, as it can lead to direct threats and challenges to people's survival and happiness. When it comes to humanity's overall, fundamental, and long-term interests, it is hard to keep a calm and rational attitude.

For the above reasons, it is extremely difficult for countries to rationally handle overall, fundamental, and long-term issues concerning resources, the environment, population, and poverty. The reason is very simple. In a fiercely competitive international environment where survival and happiness may be jeopardized at any time, it is hard for anybody to balance the interests of future generations to control the exploitation of non-renewable resources; it is hard for anyone to truly ignore current development and invest in environment protection instead; it is difficult for anyone to sacrifice their own interests to aid and support poor countries and disadvantaged groups.

As the most intelligent and civilized creatures on Earth, humans are far superior to all other species. Our only and biggest enemy is ourselves. As a species, our biggest threat comes from intraspecies competition. In order to maximize the realization of all human values, we must first dilute this type of internal competition.

In order to guarantee the overall survival and maximum happiness of humanity, we must transform our current competitive society into a new, non-competitive society. This new society should provide a safe and peaceful environment for all mankind. We must note here that eternal competitive ness is an inherent part of human nature, which means that competition will always be present in human groups. The non-competitive society we speak of will not be void of competition but will only seek to bring competition levels as low as possible.

There have been non-competitive societies in human history. During the primitive migratory stage of society, land was vast and people were few. Land was not some precious treasure worth fighting over. Human groups were isolated from each other, and peace was established both between and within social groups.

Of course, the preconditions for a non-competitive society have changed drastically. We are certainly not willing to revert to the primitive, uncivilized ways of our ancestors. Today the scale of mankind has become enormous. Various means of transportation and communication have brought all mankind into a global village. Human civilization has reached a high level, and people's ideological understanding far surpasses our ancestors'. There will be a huge difference between the global non-competitive society established on this basis and the non-competitive society of primitive times. For example, the primitive non-competitive society was formed naturally, but the future non-competitive society will be the result of rational and scientific design; the primitive non-competitive society had low living standards, low productivity, low civilization, and was small-scale, but the future non-competitive society will enjoy high living standards, high productivity, a high degree of civilization, and be large-scale. The future non-competitive society will be a brand new noncompetitive society that will bring universal happiness to all people.

Two: The Possibility of Establishing a Non-Competitive Society

In the 1970s, isolated tribes were discovered in places like the Philippines, New Guinea, and the Americas. The fighting characteristics of these tribes varied greatly from place to place. For example, in 1971, twenty-seven Tartars were found in the Philippines as part of an isolated tribe. This tribe was characterized by a total lack of conflict; there were no such terms as "arms," "war," "anger," or "hostility." After learning about tools and weapons likes knives, spears, and bows from the outside world, the tribe was only interested in items that were useful to daily life and production. They totally rejected weapons like spears and arrows. The tribe evenly distributed the various foods they collected to all members of the tribe, and conflicts seldom took place.

The Native American Hopi and Zune tribes also acted in such a peaceful manner. The tribespeople lived in complete peace for many centuries.

Conversely, some tribes are highly competitive and combative. For example, the thirty-member Fentou tribe discovered in New Guinea was fiercely aggressive and extremely fond of fighting. Native American Comanche and Apache tribes are similarly aggressive, and they are keen to train their children as fighters.

These examples show that the character of human competitiveness is flexible and can be influenced by many factors. Human society does not have to be naturally competitive but can be adapted according to social systems. In small tribal groups, these systems may be decided through the demands of tribal chiefs or rules of historical continuation. In our contemporary society, social systems will contain broader content and cover politics, economy, culture, military, society, and other aspects. All forms of policies, institutions, and measures will fall under the category of social systems.

Due to historical continuity and various inevitable and accidental reasons, isolated groups may become either competitive or non-competitive; however, once two groups come into contact, they will inevitable evolve into competing groups. This competition will spread to all other groups, and non-competitive groups will either be destroyed or forced to react in self-defense; thus, a competitive community will naturally emerge.

This is precisely how human society evolved from a non-competitive society into a competitive one. When humans settled into villages and entered the tribal stage, they acquired more wealth and increased their contact with each other. Some of these tribes were originally non-competitive groups, but they were forced to adapt after repeated attacks from competitive tribes. As the atmosphere of competition spread through the whole society, a large scale society embroiled in competition was created.

The above characteristics were retained and further intensified once human society entered the country phase. Though some countries were initially peaceful, they quickly lost the characteristic due to the generally competitive environment; thus, the country-based society became a competitive society as well.

Of course, even in this competitive country-based society, competitive awareness varies between different regions and groups and even within the same country. For example, the Southeast Asian country Laos and the country Bhutan, located in the Himalayas, are both small, landlocked countries. The citizens of these two countries have had little interference from the outside world, and they generally subscribe to the Buddhist belief. Therefore, the people here are purer in their ways and live more peaceful lives.

Within every country, competition is generally more intense in cities compared to the rural areas. This is because cities are usually closer to the centers of competition, and people there experience more psychological pressure. City dwellers are generally more indifferent to their fellow citizens and experience less happiness. Meanwhile, people in rural areas are removed from the centers of competition and retain traditional habits and customs. They experience less psychological pressure and are generally closer to their neighbors, granting them a higher level of happiness.

Regardless of these differences, the country-based society is highly competitive in nature. This competition stems from the rivalry between countries; however, the unified society will fundamentally change this situation. The emergence of the world power as a singular authority will remove all possibility of equal competition, thus creating the most important condition for a non-competitive society.

We know that the nature of a society is dependent on its social system. The world power will be the only authority qualified to determine the social system of the unified society. The singular nature of the world power will allow it to design a unique and non-competitive society for all mankind. Because this society will be exclusive, its non-competitive nature will last for a very long period of time.

In order to establish a non-competitive society, the world power may mobilize all its mechanisms to this end. A series of institutional measures can be devised and implemented to promote non-competitive moral values. The concept of happiness can be promoted; a unified policy of ethnic and religious tolerance can be implemented; non-competitive lifestyles can be introduced; a peaceful and friendly social atmosphere can be created; and a society of equalized wealth can be designed. With the continuous implementation of these institutional measures, a non-competitive society will ultimately be established.

SECTION TWO: SOME SPECIFIC PROBLEMS

We will now design and look ahead to some specific problems in the unified society based on the maximum value principle. There are many problems involved in the unification of world society, so we will only select some of the most important ones here.

One: Problems of Country, Ethnicity, and Religion

In the history of mankind, the most stable and powerful groups have always been countries, ethnicities, and religions. The country in particular is the supreme authority in the nation-based society.

The concept of country, ethnicity, and religion is deeply rooted in the hearts of people. People of the same country, ethnicity, and religion feel a natural kindred spirit with each other; they may travel all over the world, but these three concepts will always accompany them. People will naturally draw the line between friends and foes based on nationality, ethnicity, and religion. We will call this characteristic the “group identity function.”

The group identity function of countries, ethnicities, and religions is inherent and intrinsic. This function can serve to integrate society and unite different groups into one. We will refer to this as the “social cohesion function” demonstrated by countries, ethnicities, and religions.

Correspondingly, countries, ethnicities, and religions can also demonstrate a “group exclusion function,” or a “social division function.” For example, if a large country were comprised of a

number of smaller, formerly autonomous countries, these smaller countries may be mutually exclusive and hostile towards each other. (The Soviet Union split for this exact reason.) In a country with multiple ethnicities, different ethnic groups may clash and seek independence of their own. (The Kurds have been attempting to separate from Turkey to form an independent country for this reason.) The same applies to a country with multiple religions—religion will often be used as the common link in the struggle for independence. (The frequent skirmishes in the Middle East are a result of conflict between the Islamic Shiite and Sunni factions.)

The group identity function, social cohesion function, group exclusion function, and social division function are all part of the basic makeup of countries, ethnicities, and religions. The two sets of mutually opposed functions are both present in the function of countries, ethnicities, and religions.

These unique functions have allowed countries, ethnicities, and religions to exercise irreplaceably positive influences on the formation of human society. They have promoted cultural exchange and social development, and they have brought humanity from barbarity into civilization. However, these functions have also brought about some of the bloodiest wars in human history. The majority of brutal terrorist attacks have also been caused by these three forces. It is therefore an inherent fact that countries, ethnicities, and religions have both negative and positive effects.

In order to prevent the negative functions of countries, ethnicities, and religions from deterring the progress of global unification, we must focus on properly handling these three major problems. Comprehensive analysis shows that the negative functions of these three problems vary in seriousness.

After entering the unified society, all countries will have vanished—only country awareness will remain. This type of country awareness will inevitably lead to regional division and discord. To eliminate the negative effects of country awareness, it is necessary to eliminate the concept of country from the minds of people. To this end, we should first seek to dilute and eventually eliminate the regional concept of the country. This portion of country awareness usually arises from people's consciousness of their original living area. The most effective way to dilute this awareness is to encourage people to move freely, especially over long distances. Many measures can be employed to encourage free movement of the population. For example, encouraging global economic activities and integrating global economy can both be conducive to the free flow of people.

The other portion of country awareness stems purely from a desire for independent governance. To eliminate this feeling, the harms of individual state rule should be widely disseminated. In addition, balanced development should also be further promoted. If global development in all fields of economics, culture, and society can be balanced and equalized, sectoral sentiment and the distinction between regions will naturally disappear.

The negative effects of ethnicity must also be considered. In order to effectively eliminate the negative impact of ethnic dissent, we must eliminate the concept of ethnicity. This requires the

continuous integration and assimilation of all ethnic groups in the world until they finally form a whole. The concepts of “you” and “me” should be replaced with the one concept of “human.”

In a world void of ethnic differences, ethnic hatred and separatist sentiments will also disappear. At the same time, negative emotions like ethnic superiority, ethnic discrimination, ethnic inferiority complex, and ethnic resentment will all fade as well.

Ethnic fusion should include two aspects: blood integration and cultural integration. In terms of blood integration, the unified society should encourage marriages between different races and ethnicities. Cultural fusion will contain many contents; it will not be limited to cultural identity, but will also include language, beliefs, moral and ethical awareness, and a unified code of conduct. The unified society should vigorously promote all the above factors. Only when all humans achieve blood and culture integration can we declare the elimination of ethnicity. At that time, “mankind” will be the only term in the world.

Religion will be even harder to integrate than ethnicity. We often see that people are more willing to accept a spouse of a different race than a spouse with different religious beliefs. At the same time, we can also see that it is near impossible for a Muslim to convert to Christianity, and just as difficult for a Christian to convert to Buddhism.

Mutual denial, mutual exclusion, and mutual denudation are inherent characteristics of religion. The more mature and established a religion is, the more exclusive it is likely to be. Realistically speaking, the only thing that will be able to truly integrate different religious beliefs is atheism. The opposition between atheism and various religions is often much smaller than the opposition between different religions.

The transition towards atheism will be a long and arduous process; however, as time goes by and people’s understanding of nature becomes clearer, the concept of God will fade naturally. The idea of a non-existent God cannot be worshipped forever, but the morals and values of religion can be borrowed as standards for civilization and social order.

Two: Problems of Economy

On the economic front, there are at least two important aspects that will separate the unified society from the country-based society. The first is the economic environment. The contemporary economic environment of countries relies heavily on science and technology, and economic levels are often vastly uneven between different countries. The unified society will seek to adopt a unified and coordinated mode of economic operation. The second difference lies in the goal of economic action. Currently, almost every country in the world seeks to make its economy sustained, stable, healthy and strong so as to ensure that they will not be eliminated in international competition. In the absence of national competition, the unified society will not require rapid economic growth but will emphasize the wellbeing of people instead. Based on this, we can develop this following overview on the economic situation of the unified society:

First, the unified society will enjoy a level of equalized wealth. Unbalanced economic development is usually caused by a number of factors. The first is a historical factor. Some countries were isolated for long periods of times and were stuck in a primitive state after the rest of the world entered the industrialized era. Other countries were enslaved through colonialism and lost their economic autonomy as a result. Therefore, the economic starting point of countries was already vastly different.

The second is the difference in economic policies. Policymakers can determine the efficiency of economic development. Usually the poorer a country is, the less talented policymakers they will have. A wealthy country will have the educational resources to produce an abundance of exceptional policy makers; therefore, the gap between rich and poor countries will widen even more.

The third is the difference in ethnic characteristics. Different ethnic groups will have different cultural traditions, different living conditions, and different moral values. Some ethnic groups may be hardworking and good at economic development while others many not. Obvious ethnic disparities will result in uneven economic situations.

The fourth is the unbalanced promotion of science and technology. The main driving force for economic development today is science and technology. Production efficiency will be vastly different depending on the production personnel and methods. Developed countries have made extensive use of various high-tech production methods, and they continuously strengthen their own research and development capabilities; however, less developed countries are only able to adopt the most primitive methods of production. Naturally, this will produce quite a gap in economic capabilities.

The unified society will change the characteristics of human society on a fundamental level. First, it will support and aid the development of poor and less-developed countries. In the interests of balanced power and equal governance, the world power will be able to employ global resources to narrow the developmental gap between different regions.

Second, the unified society will generate universal policies for the entire globe. When establishing universal economic policies, the world power will take into account the different economic conditions of the world and balance resources accordingly. This will equalize the development of the world and ensure a more balanced global economic situation.

Third, the unified society will facilitate ethnic, religious, and regional integration. Once successful integration takes place, the gap between people’s living conditions and moral values will narrow as well. All of humanity will exhibit common intrinsic qualities, and this will be an important factor in balanced economic development.

Fourth, while restricting further development of science and technology, the unified society will also promote and apply existing mature technological achievements. As this promotion is further consolidated and deepened, the world will share in the benefits of science and technology on an

equal scale. The productivity levels of different regions will converge and the personal wealth gap will be significantly reduced as well.

To sum up, all the basic characteristics of the unified society will promote equilibrium and the fair distribution of wealth. The unified society will be a society of balanced wealth. In such an inclusive society, people will no longer feel the need for excessive comparison, and happiness will be easily obtained. Moreover, the narrowing of the wealth divide will also decrease crime rates and promote a better sense of social security.

Second, the unified society will enjoy a stable economy. The most important step in achieving global economic equilibrium will be the universal pro motion and application of mature scientific and technological achievements. If this can be achieved, it will signify the maximum utilization of science and technology. This will be one of the world power's major economic goals.

In the process of achieving this goal, the pattern of economic development will inevitably present the following characteristics. First, existing mature technologies will be spread to the furthest possible corners of the world; second, production scale will be simply expanded based on existing scientific and technological levels. Both of these factors will promote economic growth.

Economic development will still be subject to the needs of the market. Due to the limited development of science and technology, no new products will be generated. All productivity will be devoted to the manufacture of existing products, which will generate enough products to satisfy the needs of all humanity. In particular, the unified society will advocate frugal living and oppose extravagant moral values, making it possible for humans to consume the same item for a much longer period of time; thus, the consumption rate of mankind will also decrease.

In consideration of the limited resources on Earth, the world power will maintain the size of the population at a stable level. The stability of the population, lower overall product consumption rates, and efficient productivity will all contribute to a society where everyone may obtain necessary provisions. The demand of the world market will stabilize along with the global economy itself. This economic stability will be built on the premise of overall human sufficiency (food, clothing, basic necessities).

Three: Problems of Society

We will strive for a unified society that is "peaceful, friendly, and non-competitive." It should also advocate for "moderation, frugality, and surplus" as a philosophy of living. The reason for this design is that such a goal is most conducive to the stability of the whole society and the universal happiness of all humans. The policies and measures in the political, economic, cultural, and social areas of the unified society should serve this goal and design.

A peaceful and friendly non-competitive society cannot be achieved in the country-based society today due to the competitive nature of countries; however, the advent of a unified society will rectify the situation on a fundamental level. With the demise of countries, the integration of

ethnicities and religions, the restriction of science and technology, and the ensuing dilution of competitiveness, a friendly, peaceful, and non-competitive society will become reality.

Realization of the above goals and designs paints us this picture: In a peaceful society, people will live quietly and simply. Societal pressure will be less intense. As mature science and technology achievements are universally promoted and applied, people will only need to expend moderate efforts to achieve sufficient gains, but people will still uphold a frugal lifestyle and thus obtain surplus income. Life will be safe and practical.

At the same time, people will become friendly towards their neighbors, colleagues, classmates, friends, and even strangers. It will be common for people to voluntarily help out each other and interact in an amiable manner. Though people will be frugal, they will be generous when others face financial difficulty. Frugality will not be equated with stinginess, but rather with a noble way of life.

People will be generally indifferent to fame and fortune. They will not experience huge emotional upheavals in the face of loss or gain. Stable, harmonious life will be valued above material gain. In such a society, there will be few occurrences of war and crime, and the consumption of Earth's resources will be balanced.

We will discuss some more specific issues in the following paragraphs.

First, good universal social welfare will be one of the basic characteristics of the unified society. This will enhance people's sense of security and also weaken social competition. This kind of social welfare and social security system will undoubtedly require material backing. The unified society will build such a material foundation by popularizing and promoting mature scientific and technological achievements. Such promotional efforts will not only narrow the wealth gap but also provide an abundance of material wealth. This will provide reliable resources for the social welfare and social security system of the unified society.

Second, the unified society will broadly support secondary education. Higher education, especially higher education involving natural sciences, should be strictly limited. The more people who study the natural sciences, the more difficult it will be to limit the development of science and technology.

Third, the unified society will emphasize population control and the balance between human consumption of Earth's resources and the reproducibility of Earth's resources. With the limitations on scientific and technological development, humankind will not be able to rely on science and technology to obtain new alternative resources. The long-term existence of humanity will depend on the balance between resource consumption and resource reproduction. To maintain this balance, the population cannot be too large. A large population will naturally consume more resources.

Four: Moral Values

In a unified and fully integrated society, all mankind will share a unified system of moral values. Only a unified system of moral values can promote organic integration among all people. At the same time, the characteristics of a large unified society also objectively require the need for a comprehensive set of appropriate moral values. Such a moral value system will be different from the value systems of the independent countries.

In the following paragraphs, a series of moral values will be proposed based on the characteristics of the unified society. We should note here that these will only be the major criteria for the unified society. The universally recognized moral values, such as the rules against stealing, adultery, and murder, will not be discussed here. In the author's opinion, there are eight main moral values that should be emphasized in the unified society; they are peace, friendliness, frugality, industriousness, tolerance, kindness, honesty, and righteousness.

Peace refers to calmness, simplicity, harmony, and modesty. It refers to the calm acceptance of loss and gain, joy and sadness. It refers to an emphasis on harmony, humility, and moderation.

Friendliness refers to a sense of amiableness that is reflected both internally and externally. It differs from mere politeness in its pure genuineness and unpretentiousness. Friendliness should be selfless and quietly expressed from the heart.

Frugality refers to thrifty spending and simple living. Frugality opposes the waste of energy, time, and money; it emphasizes reasonable arrangement of personal expenses and good saving ethics. Under this value, items should be utilized to their full potential and not prematurely abandoned.

Industriousness refers to diligent labor, conscientious work, and a down to-earth attitude towards exertion. Hard work is not contradictory to peace and frugality; in fact, it emphasizes the fact that effort is necessary for gain. Industriousness does not mean over-working; it merely refers to a no pain, no gain work ethic.

Tolerance refers to leniency, forgiveness, forbearance, and acceptance. It is opposed to holding grudges and narrow mindedness. It requires people to embrace things with an open mind and forgive others with an easy heart. Tolerance requires faith and understanding in the face of conflict. Without tolerance, a harmonious and peaceful society will be impossible.

Kindness refers to benevolence, consideration, and compassion. Kindness is a demonstration of voluntary sacrifice for others; this sacrifice should be sincere, generous, and undemanding.

Honesty refers to scrupulousness, sincerity, and credibility. Honesty means real communication between people, genuine products provided by the enterprise, and 100 percent realization of the government's promises.

Righteousness refers to integrity and candor. It requires people to have a sense of justice and responsibility as well as the courage to uphold social justice.

Five: Problems of Politics

1. The Principle of Popular Sovereignty

The maximum value principle will be most concretely embodied by the principle of popular sovereignty. This principle regards every member of humanity as an equal member of society with corresponding representative power. Under the principle of popular sovereignty, everyone is entitled to the same rights of freedom, survival, happiness, and justice. These rights can never be wrested away.

In the unified society, the principle of popular sovereignty will place special emphasis on the equal political rights of all citizens. Every citizen in the world will have the right to express their opinion, vote, and be elected. The successful implementation of popular sovereignty will largely depend on the structure of the political system and the rationality of power.

2. The Standards of Government

Today's democratic theories generally accept Montesquieu's ideas of decentralization. Montesquieu believed that the power of a country could be divided into legislative power, executive power, and judicial power. He believed this to be the best way to prevent abuse of power.

In Montesquieu's view, the abuse of power was a common phenomenon—even in democracies where the government was elected by the people. If power were too concentrated and beyond the control of the people, it could be derived from the people. State power could be transformed into a tool for autocratic rule, and it would inevitably lead to various official drawbacks, such as corruption and the abuse of power. In order to avoid authoritarian rule, states had to separate power into executive, legislative, and judicial branches and allow the three powers to mutually restrain and balance each other. Montesquieu's theory of decentralization was coined the "separation of powers."

We agree with two of Montesquieu's views. First, political power can be divided into executive power, legislative power, and judicial power. Second, power can only be restrained and balanced by power. If the three powers are not divided, dictatorship may easily occur.

Nevertheless, two hundred years of democracy has also highlighted many problems with the system:

a. Democracies have poor implementation capabilities. In a democracy, all major administrative decisions require repeated debate and discussion by the parliament. Different political parties oppose and dismantle each other's arguments, further impeding the progress of decision-making.

b. Power is easily usurped by manipulative and eloquent politicians. Politicians will often lie and spin yarns to serve their own interest, thus leading the entire community astray.

c. Excessive democracy may be problematic. Demonstrations occur frequently in democracies. When social sentiment is used by opposition parties, social disruption may occur and even lead to bloody conflicts.

d. Frequent changes in governing bodies may lead to inconsistent policies. Newly appointed leaders will often dismantle the policies of the previous administration, regardless of whether they are effective or not. This may result in the waste of resources as well as general social confusion.

The above problems can be easily avoided in non-democratic countries; however, non-democratic countries have their own flaws:

a. There is no guarantee that the designated leader will be upright, hard-working, and devoted to the people. If a tyrant or dictator emerges as leader, the people suffer. If the regime is hereditary, the suffering of the people will never end.

b. There is no guarantee that regime change will be smooth and orderly. Without surveillance and testimony, bloody killings may occur between potential succession candidates. Additionally, if candidacy for rule is very limited, or designated through kinship, truly qualified people will never gain the leadership position.

c. There will be no restraint of power. With an excess of power and a lack of supervision, even wise rulers will be prone to power expansion, decision errors, and management mistakes.

d. There will be no opposition mechanism or public opinion apparatus. If the public is not allowed to express grievances, social injustice will accumulate until major social crises erupt. This may culminate in massive and brutal conflicts in which the regime must be overthrown through violence.

Some research has been conducted to determine the advantageous combination of the two governing systems. For example, the elitist-governing method designates that the national leader will be recommended by a group of elite thinkers. The new leader need not be related to the previous leader, but only needs to have good political experience and exceptional work performance. Another system designates that the leaders of the country be a committee of several people, rather than one individual.

We believe that a good governing system should have the following characteristics:

a. It should have strong executive power with minimal interference but also be subject to supervision and restraint.

b. Legislative power should not be manipulated by politicians. The most important legal principles of the unified society should be long-term and unwavering (such as the restriction of science and technology development).

c. The judicial power should be legal, fair, and effectively supervised.

d. Military power should be subject to many levels of balance and restraint to avoid military intervention in political affairs or military dictatorship.

e. The fluctuations and transfers in power should be orderly, reasonable, and fair.

3. The Design of the Governing Body

a. Political Principles

The unified society should be based on the principles of limited democracy, limited freedom, and full equality. It will be different from both the democratic and the autocratic countries that exist today. The unified society will be an equal society. Whether you are rich or poor, whether you are a senior official or a civilian, whether you live in the present or future generation, you will be born equal and no one should deprive the rights of anyone for any reason.

b. Legal Society

We must particularly emphasize that the unified society must be a legal society where everyone will act according to law. No one will be allowed to violate the principles of law, and any offenders will be subject to legal sanctions. The legal society will be an important part of the political system.

The legal society cannot be separated from the balance of power. If power is not restricted and is allowed to inflate indefinitely, law will no longer have restraining capacity. If political power is not checked and balanced, there will be no way to guarantee a legal society. Without a legal society, there will be no unified society.

As far as the overall objective of human society is concerned, the unified society is far more significant than the country-based society. The unified society aims to save all humanity from extinction; there can be no goal more important. The purposes and important principles of the unified society cannot be violated or undermined.

The long-term nature of the unified society not only requires the legal system to be perfected, but also that it be fairly stable. In particular, the existence of a stable and strongly binding world constitution will be required. As the fundamental law of the world, the world constitution should be multi-faceted in content. Not only should it limit the development of science and technology, but it should also regulate the world political system, economic system, social system, and moral values. Parts of this content can be changed and adapted with the times, but other parts must remain unwavering. For example, unless mankind evolves on a fundamental basis, the restriction of science and technology development cannot be lifted.

How can we ensure its principles to be insurmountable, its content to be adaptable, and its binding power to be absolutely binding? It reasonably follows that the world constitution must be different from national constitutions. For example, national constitutions can often be amended through specific procedures as long as a sufficient number of parliament members agree to do so. In contrast, some portions of the world constitution will never be open to amendment and must also be extremely binding. In order to provide credible guarantee for this most important principle of the unified society, we believe that there should be a Constitutional Safeguard Law on top of the world constitution.

The constitutional safeguard law will set forth binding requirements for any amendment of the most important principles of the constitution; these requirements will be far more rigid and exacting. Under the protection of the constitutional safeguard law, the most important principles of the constitution will be extremely binding, and anyone who violates these principles will be severely punished. Every person will think twice before attempting to challenge such principles, especially those with supreme power.

At the same time, the most important principles of the constitution will not be amended by the usual constitutional changes. Under the constitutional safeguard law, the inherent codes of the constitution will remain untouched, except in the event of tremendous change or terrible catastrophe.

4. The Design of Power

Based on the above discussion, we can design a specific power framework for the unified society.

a. Executive Power

The highest executive power of the unified society should be in the hands of a world committee (hereinafter referred to as “the committee”) consisting of three, five, or seven persons (i.e., singular numbers). The chairman of the committee will be the convener of the committee, and the position will rotate every half year or one year. The members of the committee will divide executive responsibilities, but a collective vote will be required on any major issue. Every member of the committee will have one vote; if there are abstentions, the convener’s vote may count as a 1.5 vote for strictly tie-breaking purposes.

The establishment of the executive committee is in consideration of two main factors. First, a one-person chief executive system will easily result in dictatorship. Second, the adoption of a stable institution with rotating members will promote balanced power and a stable political environment. The rotation of the committee members will happen gradually and one at a time. For example, if the committee has five people, each person will have a term of five years, and one member will be updated every year. This way, there will always be fresh voices and new energy on the committee, but policies will still be maintained.

The members of the committee will only be allowed to serve two terms in their entire life, either in succession or separately. This will prevent the formation of power groups and dictatorship. If a committee member must leave their position midterm for any reason, it will count as serving one full term.

After establishing the above restraints to prevent dictatorship, the executive ability of the committee should also be guaranteed. Once a decision is made by the executive committee, it should not be stopped by any other institution except in extreme cases. Such extreme cases may be: if over four fifths of the parliament votes against it (excluding military actions); if over four-fifths of the federal court judges declare it unconstitutional; or if over four-fifths of the general population opposes it.

b. Legislative Power

The parliament of the unified society will be both the legislative branch and the participating government branch of the unified society. The unified society will adopt a representative system in which the general population will elect representatives to participate in politics on their behalf. Parliamentary representatives will be elected through an equal process from all over the world. They will be allowed to occupy for successive terms, but they will not be allowed to hold simultaneous executive positions. At the same time, the members of the executive committee will be elected by the parliament as well. Committee candidates do not need to be parliament members, but if they are, they must resign their parliament positions once elected to executive office.

c. Judicial Power

The judges of the unified society's Supreme Court will be nominated by the executive committee and voted on by the parliament. Judges may hold longer terms (lifetime terms may also be considered), but at least two-thirds of judges should not be nominated by the executive committee members in power. For example, if the committee was composed of five members and one member is rotated each year, at least three members should have not participated in the nomination of more than two-thirds of the incumbent judges.

d. Military Power

The unified society should possess one centrally controlled army; however, due to the demise of countries, external defense operations and external wars will disappear. Therefore, the role of the military will also change accordingly. Military expenditure will vastly decrease, and weapons of mass destruction will be seldom equipped. The role and characteristics of the military at this time can be broadly summarized as follows:

First, it will serve to safeguard world unity and prevent separatist movements; second, it will calm unrest and stabilize social order when ordinary police forces are inadequate; third, it will participate in major disaster relief operations (this will be one of the major tasks of the military); fourth, it will deal with threats like alien invasion and asteroid impact. (Although these threats are

highly improbably, in the unlikely event that they do occur, the military has a sacred duty to defend Earth.)

Military power will be subject to executive power, but there will be corresponding restrictions on executive control of military power. The executive committee will not have the absolute and comprehensive right to deploy military forces.

First of all, the military power of the unified society should be subdivided. For example, the military forces of the world may be split into fifteen equal shares to prevent military dictatorship.

Second, there should be a dual-control system in regard to military power. The control of all armed forces should be divided into two equal parts: decision-making and command to action. The decision to participate in an operation should be made by the military's decision-makers, while specific commands of the operation should be issued by the commanders. This separation of power is intended to prevent army control from becoming overly centralized or adversely manipulated.

Third, the decision-makers and operational commanders of each army should not be allowed to stay in term in the same army for too long; at the same time, any commanding officer should not be allowed to stay in a position of power indefinitely. Such considerations are intended to avoid formation of private armies by high-ranking officers.

Fourth, the decision-makers and commanders of each army will be nominated by the executive committee and voted on by the parliament in stages. No more than half of the in-power committee members can participate in more than half of the nominations.

Fifth, strict rules and regulations must be placed on the mobilization of armed forces. There should be a clear limit on the maximum number of troops that can be dispatched by the committee at one time. Any dispatch of troops will require a proposal from the committee and a vote by the parliament. When excessive numbers of troops are to be mobilized, a substantial number of votes will be required simultaneously from both the parliament and the Supreme Court.

e. Police Power

Police power will also be subject to executive power, but the executive power will not be permitted to fully dictate the movements of the police either. Moreover, the decision-making power and operational command power of the police force must also be separated.

In the unified society, the police will only be lightly armed and governed by regions. The global police administration will only be a law enforcement coordination department.

f. The Local Administrative Heads of the Unified Society

The local administrative heads will be appointed through a semi-appointment system to prevent both executive dictatorship and executive weakness.

The general design is as follows: the local parliament will select no less than three candidates according to the number of votes they each obtain, and the higher-level administrator will fill the position from the three candidates. If the appointed candidate is incompetent, their supervisor may remove them from their position and request a new list of candidates at any time. This way, there will always be three candidates in place awaiting appointment. If any candidate must leave their position, the local parliament may elect new supplement candidates as needed.

g. Summary of the Power Design Principles

The unified society will adopt a system of "three-dimensional separation of power" to ensure both balance of power and effectiveness of implementation. The three-dimensional separation of power has three aspects. First, power will be divided within the same level, like the separation of executive, legislative, and judicial power. Second, the same power will be controlled by different persons, like the separation of decision-making power and operational command power in the military and police. Third, power will be decentralized and separated in hierarchy, like the separation of power between the centralized government and local states.

The above designs are all established to prevent dictatorship; however, a truly good government must also have strong, effective implementation of power. To accomplish this goal, the following designs are proposed: First, unless over four-fifths of the parliament votes against it (excluding military actions), over four-fifths of the federal court judges declare it unconstitutional, or over four-fifths of the general population oppose it, executive decisions cannot be changed or reversed. Second, local administrative heads will be "semi-appointed" through a combination of equal election and final appointment. Third, the executive committee will maintain "institutional stability and member rotation" to ensure the consistency of policies and decisions.

5. The Political Culture

Contrary to the country-based society, the unified society will be a "friendly, peaceful, and non-competitive society." It will last for a very long time and will strictly maintain the restriction on science and technology development; the unified society will also advocate stable economic growth. The political culture of the unified society must serve all these goals.

a. Peaceful Political Participation and Election

As a "friendly, peaceful, and non-competitive society," the unified society will advocate peaceful political participation and oppose fierce political debates and attacks. Political participation should be mainly conducted through written word, TV appearances and radio. Direct confrontation and mass gatherings should be discouraged.

Since the executive committee of the world power will be comprised of multiple members—likely from different parties—specific party opposition should be discouraged. Political candidates should focus on personal conduct and political ability when mounting campaigns; party-led campaigns will not be supported.

b. Peaceful Political Discussion and Demand

Political opinions and demands should be expressed in a peaceful and friendly manner. Written statements, television appearances, and radio broadcasts will all be encouraged. Large-scale political gatherings will be discouraged, especially large-scale rallies and political demonstrations. Although free speech and different political opinions will be encouraged, they must be expressed in peaceful, non-confrontational ways.

c. Prohibition and Censorship

The goal of the unified society is to prevent humanity from extinction; thus, some of its fundamental principles can never be changed. The strict restriction on science and technology development is one such principle; however, there will always be people who manipulate truth for their own purposes and disregard the overall interests of all humanity. To prevent the principles of the unified society from being slandered by nefarious conspirators, some degree of prohibition and censorship must be established. Doubt can never be cast upon the most important principles of the unified society. Society should not be allowed to question these principles, and political participants will not be allowed to debate them in any negative manner. All public officials must take a sacred oath and swear to uphold these principles.

Chapter Twelve Value Assessment of the Unified Society

A value assessment of the unified society will help us determine the significance of the unified society. Will it be worth abandoning the country-based society we have today for a brand-new world system?

Social forms are a category of social systems, which should be assessed according to the maximum value principle. This principle requires us to judge whether the maximum values are being realized for the maximum number of people. We will adopt two approaches in the evaluation of the unified society. First, we will directly compare the main values (i.e., survival and happiness) of humans living in the unified society to the country-based society; second, we will conduct a comprehensive evaluation of the justice of the unified society compared to the country-based society.

SECTION ONE: ASSESSMENT OF HUMAN VALUE REALIZATION

One: On Human Survival

The survival of mankind is the foundational value of humanity; it transcends all other values, and any further discussion would be pointless without it. The unified society is significant for the survival of mankind in the following ways.

1. It Resolves the Overall Extinction Crisis

Science and technology development is a double-edged sword that may benefit and harm humanity at the same time. If science and technology keep developing at their current speed, humanity will face extinction in the near future.

The only way to prevent human extinction is to limit science and technology from further developing. This will only be achievable in a unified society with centralized governance and control. We all know that overall human survival is the highest value known to man, so this makes the unified society extremely significant. All the values of today's country-based society will pale in comparison.

2. It Eases the Survival Crisis of Individuals and Groups

Analysis of human society shows that group survival is mainly threated by war and large-scale terrorist attacks, while individual survival is mainly threated by criminal homicide. Historically, there have been four main causes of war. The first is confrontation between countries. These wars are the most common and generate the highest casualties. The second is the conflict between ethnicities, and the third is hostility between religions. These three types of wars not only result in military casualties but civilian casualties as well.

The fourth cause of war is the fight for internal dominance that results in civil war. These wars are mainly aimed at wresting power from the highest administrative leaders of a country, the highest ethnic leaders of an ethnicity, or the highest religious leaders within a religion. This type of war generally does not lead to deliberate massacre of civilians, since their goal is to replace the party in power to rule the people.

Now let us examine criminal homicides. The largest and most devastating form of criminal homicide is terrorism. Terrorist attacks can be triggered by ethnic or religious hatred. When intense hatred exists between conflicting ethnicities or religions and war is not possible, terrorist attacks will be launched instead. Another form of criminal homicide stems from dissatisfaction with society, hatred of individuals, or greed over possessions. This type of criminal homicide is usually perpetuated by one or a few individuals, so they bring less casualty and shock to the community.

In a unified society, countries will have perished and the world power will be the sole supreme authority; therefore, the confrontation between countries will have disappeared. Furthermore, as humanity becomes one and ethnicity and religion integrate into one, ensuing conflicts and hatreds will vanish as well.

As a result, the three former types of war will all be eliminated and only civil war will be left. However, since civil war is aimed at seizing either administrative, ethnic, or religious dominance, and both the latter will have been integrated, only civil war aimed at wresting administrative leadership will remain.

We know that violent acquisition of power generally happens when a regime cannot be renewed in a democratic and orderly manner. From today's political values, the unified society will neither be hereditary nor a dictator ship; thus, the democratic and orderly transfer of power will be entirely possible, and violent civil wars will be largely unnecessary. Even if such civil wars do erupt, they will be less brutal than the other types of wars, and civilian casualties will be minimal.

When it comes to criminal homicide, terrorist attacks are obviously the most deadly and large-scale. However, in an ethnically and religiously integrated society, the motives for terrorism will have vanished; therefore, terrorist attacks will no longer be a threat to society.

Criminal homicide perpetuated by individuals will always exist, but the unorganized nature of these killings will minimize their harm. In addition, this type of homicide will be greatly reduced in a unified society for the following reasons:

First, the inherent competitiveness of countries will promote ideals like bravery, adventurism, and revenge. These values may lead people to become restless and impulsive enough to perpetuate murder. The unified society will be non-competitive in nature and will advocate morals like peace, friendliness, and calmness. As these morals permeate all levels of society, crime rates will drop accordingly.

Second, wealth inequality is a big problem in the country-based society, and it is partially due to the development of science and technology. The unequal distribution of wealth is a huge factor in psychological imbalance, which in turn leads to homicidal intent. In a unified society of balanced wealth, criminal homicide motivated by divisions in wealth will be significantly reduced.

Third, in a unified society where mature science and technology achievements are widely promoted, life will be plentiful. People will only need to expend moderate efforts to meet their basic needs; thus, there will be no need for criminals to commit murder to obtain material goods.

Fourth, as countries, ethnicities, and religions are integrated, the unified society will restrict firearm possession in the interests of all mankind. Other means for killing will also be safeguarded and restricted; thus, the conditions for crime and murder will be severely reduced and crime will decrease accordingly.

The unified society will greatly reduce instances of war and criminal homicide. By diminishing these issues that have long plagued human society, group and individual survival pressures will be alleviated as well.

3. It Minimizes Intergenerational Survival Crisis

The various environmental problems, resource problems, and population problems we face today not only concern the sustainable development of human society, but also the lives of our future children and grandchildren. These problems concern both the survival values and the happiness values of the future generations. For the sake of narration, we will incorporate these issues under the category of "intergenerational survival."

We all know that humans are currently plagued by a series of serious environmental, resource, and population problems. The use of Freon has led to the destruction of the ozone layer; the emission of greenhouse gases has led to global warming; acid gas emissions, as well as large-scale industrial production, has resulted in acid rain and other air pollutions; uncontrolled land use and the destruction of forests, grasslands, and wetlands has caused desertification and loss of biodiversity; severe industrial and agricultural pollution and explosive population growth has resulted in a water crisis; and the uncontrolled exploitation of non-renewable resources is leading to serious resource deficiencies. The crisis of intergenerational survival is clear at a glance. The characteristics of the country-based society are hindering the effective solution of these problems.

a. The supreme power of the country-based society is the country. Leaders of each country will first consider the interests of their own country before considering the interests of mankind. That is why the specifics of many issues are still being debated despite universal awareness of the crisis and the constant coordination of the United Nations.

b. The long course of human history shows that the competition among nations is extremely cruel. Wars between nations lead to countless casualties, and the losers often suffer a great deal. No country dares to fall behind in the competition against others. In such an atmosphere, countries

cannot consider whether the means of competition they adopt will endanger the future generations, only if they bring immediate benefits.

Due to the diversification of nations, there will naturally be comparison between countries. When there is a divide between countries, leaders will try their best to catch up. Moreover, if people are dissatisfied with their own living standards compared to the living standards of neighboring countries, they will be dissatisfied with the government as well. This is what rulers are most afraid of.

In order to avoid the above situations, country leaders will use all means necessary to promote development, whether the means are moral or not. Such immoral means may include the uncontrolled exploitation of non-renewable resources, the uncontrolled use of land, or the indiscriminate exploitation of forests. This will inevitably lead to resource depletion, desertification, forest destruction, soil erosion, and the loss of biodiversity.

c. In the country-based society, the independent development of countries will lead to huge disparities in wealth. Issues like population explosion, desertification, resources shortage, and environmental destruction are all directly or indirectly linked to wealth inequality.

The fundamentally different characteristics of the unified society can lessen the above problems to a large extent, and some problems can even be completely resolved.

a. The world power will be the only regime in the unified society; it will represent the overall interests of humanity, and all inconsistencies will be effectively eliminated. Regional development may still progress along its own course, and regional interests may endanger the overall, fundamental, and long-term interests of humanity at some point; however, whenever such a situation occurs, the world power will do everything it can to effectively control and impede the threat.

b. The unified society will eliminate the concept of country and with it the need for inter-country competition. Without the constant pressure of international competition, countries will no longer need to rely on immoral means to promote faster development. The interests of the future generation may be considered and safeguarded accordingly.

c. The unified society will enjoy a balanced and equalized level of wealth. As mature science and technology achievements are universally applied, the lives of all humans will be affluent and comfortable. With further improvements in education and social security, the global population will be controlled at a stable level as well; thus, the series of issues that will determine the sustain able development of human society can be greatly alleviated. The survival and happiness of future generations will also be protected, thus minimizing the intergenerational survival crisis.

Two: On Human Happiness

Happiness is an emotion; it is the peace and satisfaction of the soul. Happiness requires basic living conditions, personal safety, freedom, and equality as well as physical health. Relative to the country-based society, does the unified society bring more happiness or more suffering to humans?

1. A Relaxed and Happy Life

In the country-based society, all citizens are bound by the competition of their respective nations. As the world evolves more and more rapidly, the social environment becomes more competitive as well. Although people may acquire more material wealth in contemporary society, they rarely find enjoyment due to the extreme psychological stress brought on by the highly competitive environment. In fact, mental depression has become a ubiquitous modern ailment.

A person works both to obtain material wealth and to pursue a happy life; however, the reality of the highly competitive society is that material wealth does not bring happiness, but rather pain. The unified society will eradicate the concept of country and thus create the possibility for a peaceful, friendly, and non-competitive society. The limitation of science and technology will also alleviate the pressure to constantly learn and innovate. Once the intense competitive pressure dissipates, the society will become more relaxed.

The limitation of science and technology is not the elimination of science and technology. On the contrary, the unified society will popularize and apply many mature science and technology achievements. Once these achievements are evenly spread throughout the world, a balanced state of affluence will be attained. In terms of material wealth alone, universal happiness will be greatly enhanced. Moreover, the decrease in military affairs will bring about massive reductions in military expenditure. This amount alone will be enough to eradicate poverty on a global scale.

The unified society will only need to maintain one unified administrative structure. This will lead to reduced government expenditure. The surplus can again be used to better the lives of the general population.

The integration of world economy will also lead to reduced enterprise managements fees, transportation fees, tariffs, and other expenses. This will increase the efficiency of enterprises and improve world economy, so people’s living standards will also benefit.

In short, the unified society will be a fully employed, affluent, happy, and relaxed environment.

2. A Satisfactory Spiritual Life

Happiness can be found in the satisfaction of the soul, and satisfaction is obtained through comparison. This comparison is with both the surrounding people and one’s own past. As long as the difference is not too big, people will be satisfied.

It is very difficult to feel satisfied in a rapidly evolving society, as one must endure tremendous pressure to keep up with the pace of the world. The moment a person stops racing forward, they fall behind. This is why we constantly lament the pressures and stress of contemporary life.

A society of unequal wealth is not one that affords much spiritual satisfaction. The majority of poorer people will always feel dissatisfied in comparison to the extremely wealthy individuals. The unified society will rectify this situation. With the limitations on science and technology development, the world will enter a period of stability. Pressures to develop and innovate will lessen.

The equalization of wealth in the unified society will also alleviate psychological imbalance caused by wealth disparity. Moderation, frugality, and surplus will be promoted as philosophies of life; therefore, people will live a spiritually fulfilled and satisfied life.

3. A Peaceful and Hopeful Life

A peaceful and non-competitive life opposes fanatical risk-taking, endless competition, and confrontation; however, a peaceful life is not a life without pursuits or hope. Quiet simplicity is a pursuit; pastoral life is a pursuit; moderation, frugality, and surplus are pursuits. In a unified society, people will continue to pursue happiness and joy, but they will do so in a relaxed and peaceful environment. This environment will also be conducive to a hopeful life.

4. A Peaceful and Stable Life

In the unified society, social conflicts will subside, general affluence will be achieved, and criminal activity will be reduced. As a result, the unified society will experience minimal wars and minimal crime. Such a stable, peaceful existence would not be possible in the inherently competitive country based society.

Happiness is heavily dependent upon a sense of security. If one were faced with constant threats of terrorism, war, murder, robbery, and other threats, it would be difficult to feel genuine happiness. The unified society will seek to eliminate war and crime to promote a secure way of life.

5. A Healthy and Long Life

The unbalanced nature of the country-based society results in unequal distribution of wealth, frequent wars, frequent terrorist attacks, and high crime rates. Due to this, the health conditions of citizens from different nations varies greatly, as does life expectancy.

The unified society will be generally affluent and void of poverty. At the same time, medical achievements will be popularized across the globe so that world health levels will reach an equal and maximum state. In addition, threats like war and crime will be reduced as well. This will all create the conditions for healthier, longer lives.

The average life expectancy of people in the unified society will surpass that of the developed countries today. People will be healthier both physically and mentally. A healthy and long life will become a universal possibility.

6. A Free and Equal Life

Happiness would not be possible without freedom and equality; this is a universally accepted fact. However, equality and freedom cannot be widely realized in the country-based society. The overall human condition in countries is extremely unequal, as only some people are afforded the rights to equality and freedom.

The realization of the unified society will create solutions for the above problems. First, the unified society will be a society of equalized wealth, so division in property will become balanced.

Second, the unified society will adopt a system of democracy and popular sovereignty. Under such an environment, all people will receive political freedom and human rights.

Third, the unified society will implement an excellent social welfare system. All humans will be able to satisfy their needs on an equal footing. Therefore, from the perspective of all humanity, the unified society will bring unprecedented equality and freedom.

SECTION TWO: ASSESSMENT OF SOCIAL SYSTEM JUSTICE

Justice is an important value of the social system (detailed in Chapter Two, section two); it stems from humanity's need for rationality. Justice is indispensable for the realization of the maximum value principle.

Whether or not the unified society has a just social system will be an important indicator of the overall value of the unified society. To assess the justice system of the unified society, we must analyze whether its social system is fair and reasonable from the perspective of all mankind. For a more comprehensive and in-depth analysis, we will separate justice into four aspects: general justice, group justice, individual justice, and intergenerational justice.

One: General Justice

In the country-based society, competition and conflict among nations often ends in war. As the supreme power of the society, the country's primary consideration is often the prevention of invasion and the perpetuation of one's own invasion. From the perspective of general justice, a social system should first guarantee the survival of humanity, but this is not the case in the country-based society. The social system of the country-based society is completely lacking in rationality.

It is the irrationality of the social system that often leads to the most advanced science and technology achievements being applied to war and destruction rather than the benefit of humanity.

The competitive and antagonistic nature of inter-country rivalry means that countries can spare little thought for the happiness of the people when designing a social system. Instead, they will place competitive advantage as the priority of all policies and social systems.

We can see that most countries would rather expend large amounts of money on military expenditure instead of in support of the poor. This is obviously not conducive to the happiness of people. We can also see that countries often create a tense and competitive environment to motivate their people, which is also not conducive to happy living.

The unified society's social system will be fundamentally different from that of countries. It will focus on safeguarding universal happiness, security, and survival. The rationality of the unified society's social system will far exceed the rationality of today's country-based social system.

Two: Group Justice

We say that all people are born equal regardless of region, color, age, and so on; however, we observe that with the same efforts, citizens of one country may earn one thousand US dollars while citizens of another country may only earn ten dollars; citizens of one country may enjoy good social welfare while citizens of another country may be forced to beg on the streets; citizens of one country may live in a democratic, open, and free political environment while citizens of another country may be ruled by an autocratic monarchy. Though we are all human, some ethnic groups are discriminated against while others can be as arrogant as they please. This is obviously unfair.

Since it is generally accepted that humans are born equal, people of all countries, ethnicities, and religions must share in equal human rights. This is the only fair definition of equal human rights in terms of group justice; however, achieving such a goal is impossible in a country-based society.

In the fully integrated unified society, all people will be governed by the same regime. They will enjoy the same kind of social welfare, the same political, economic, and cultural rights, and be obligated to fulfill the same responsibilities. Therefore, only the unified society will be able to truly realize equal human rights for all mankind.

Let us continue to analyze group justice from another perspective: one cannot sacrifice someone else's life for one's own, and one cannot base one's own happiness on the suffering of others. This is a generally accepted basic moral code; however, human groups often violate this code.

War is the most typical and cruel act of group injustice. The country-based society has never been free of war. Larger countries plunder smaller countries all the time, robbing them of wealth and causing casualties on both sides. Although this phenomenon is inherently unjust, it is a basic component of the country-based society.

Terrorist attacks are similarly unjust. They are often perpetrated due to national, ethnic, and religious hatred. Many innocent lives are lost in the process. This is also a typical feature of the injustice of the country-based society.

The unified society will not be able to completely avoid war and terrorist attacks, but only reduce them as much as possible. Once countries, ethnicities, and religions are fully integrated and the society reaches a balanced level of affluence, war and terrorism will lose most of their motivation. In terms of group justice, the unified society will be far superior to the country based society.

Three: Individual Justice

As human individuals, the basic principles of justice include not stealing the property of others; not threatening the survival of others; not depriving others of happiness; not acting contrary to public moral standards; and not disrupting the harmony of society. It will be impossible for any society to require everyone to meet the basic principles of justice. Every society will have people who violate public morals and laws; however, in comparison with the country-based society, the unified society will be able to minimize individual injustice.

Needless to say, countries will emphasize and vigorously promote the demand for individual justice in the hopes of achieving social stability and harmony, but the basic characteristics of the country-based society determine that even while countries advocate and defend individual justice, they are simultaneously diluting and collapsing individual justice.

In human society, there are three powerful agents that motivate mass destruction: nationality, ethnicity, and religion. These three forces simultaneously coexist in the country-based society, and as a result, war and terrorism follow. The general environment will imperceptibly affect every person living in it, and humans have always been especially accustomed to imitating and learning from example. When countries with inherently unjust forces in them ask for individual justice from their own people, the hypocrisy of the situation will generate very limited results.

In addition, countries will often advocate values like bravery, risk-taking, and innovation to promote their competitive advantage; however, these values may be interpreted in negative ways. People may bravely commit robbery, take risks to commit homicide, or use the latest and most advanced means to carry out their crimes.

For the above reasons, the country-based society will often have high crime rates, and a high portion of people will choose to violate public morals. These are all manifestations of individual injustice.

This situation will be changed drastically in the unified society. With the demise of countries and the integration of ethnicities and religions, the most formidable forces of antagonism will have vanished. The unified society will not only be able to formulate a system of individual justice but will also be qualified to set the example for the principles of justice.

The unified society aims to create a “peaceful, friendly, and non-competitive” environment. This will greatly mediate interpersonal relationships within the society. Coupled with an atmosphere of general affluence, the unified society will easily achieve lower crime rates and better compliance with public moral values; thus, the individual justice of the unified society will far supersede that of the country-based society.

Four: Intergenerational Justice

Humans may be able to survive for a long time to come, but the earth’s resources are limited. If we deplete these resources today, we will seriously affect the survival and happiness of the future generations. That would no doubt be a shameful and immoral act, yet we are already acting in such an irresponsible manner. Our uncontrolled exploitation of non-renewable resources is causing serious resource depletion; over-farming of the land and overgrazing of the grasslands are leading to desertification; deforestation is leading to soil erosion, water scarcity, and loss of biodiversity. We are making the planet less and less suitable for human existence, thus increasingly endangering the interests of future generations.

Humans have long been aware of these issues, and the United Nations has exerted much effort to prevent these behaviors. Unfortunately, no substantial results have been obtained. The fierce competition between countries often makes it difficult for country leaders to consider the interests of future generations—especially when they are still occupied with the interests of the current generation.

In contrast, the unified society will represent all mankind, regardless of the generational divide. In the non-competitive environment, the unified society will be able to rationally plan the affairs of humanity. The achievement of equalized wealth and sufficiency will also make it easier to resolve resource issues, environmental issues, and population issues. Both the direct value realization assessment and the indirect social system justice assessment prove the unified society to be more advantageous than the county-based society.

The only impediment of the unified society will be the decrease of material enjoyment brought on by the limitation of science and technology development; however, as a mere subcategory of the happiness value, this type of material enjoyment cannot obscure the bigger picture. Contemporary material enjoyment is often accompanied by intense mental pressure, which in turn lessens the feelings of happiness. The sacrifice of this material enjoyment is to guarantee the overall survival of mankind—a cause far greater than all else; thus, from this point of departure alone, we can ascertain that the unified society is far more beneficial to humanity than the country-based society.

The significance of the unified society is far more than this. Its guarantee of universal happiness for all generations is unparalleled, and the country based society cannot begin to compare with the quality of life that the unified society can offer. In all ways, the unified society is an undoubtedly ideal society.

Our original intention for the unified society was to prevent human extinction; however, a series of analysis has revealed the unified society to be the most ideal society in accordance with the maximum value principle. Therefore, the social choice that humans must make is now completely aligned with the most ideal choice that humans can make.

Chapter Thirteen A Call to the Giants

We have determined that global unity is the only path that will prevent human extinction and also maximize the realization of overall human values; furthermore, the unification of mankind is no longer just a necessity, but also a possibility.

Humans must be the impetus behind global unification. The transformation from a country-based society to a unified society will an unprecedented social reform as well as an unparalleled rational choice. Its significance and influence will be unsurpassed. In the face of such a great cause, what forces can we rely on?

SECTION ONE: THE RESPONSIBILITY OF THINKERS AND POLITICIANS

Any major social change will require an enlightenment of ideology as a basis. This ideological awakening will take some time to process. The direction of history is usually shrouded to the general public, so only the handful of profound thinkers will recognize the true way of the future. These prophets will recognize the turning points of history before everyone else.

Thinkers alone are not enough to change the course of history. Major change must always be endorsed by the masses. Unfortunately, ordinary people lack serious consideration and research of the general direction of history, as well as a systematic theoretical foundation for enlightenment; therefore, an ideological movement is required to promote widespread dissemination of mature ideological theories proposed by the leading thinkers.

Once these theories are widely accepted by the people, it will transform into a force for change, and new history will be created.

It would be impossible for a new world order to be born without the drive and support of the people; thus, some persons must emerge to unite the people into a formidable charge and lead the process of change. These persons are usually the political leaders of the specific era. Without their powers of integration, social reform could not take place. Thinkers and politicians must work together to first awaken and then unite the general public into a new era.

The crucial role of thinkers and politicians can be clearly seen in the development of world history. We know that feudal theocracy ruled Medieval Europe for thousands of years. Under this rule, the world had no creativity and the people were in a state of ignorance. It was the rise of the Renaissance movement in the fourteenth century that brought about ideological liberation and destroyed the shackles of theocracy and feudalism. The ideological liberation movement promoted by the Renaissance freed Europe from the darkness of feudal theocracy and led the world out of the Middle Ages.

The Enlightenment movement in the seventeenth and eighteenth centuries was the second ideological liberation movement in modern history. The movement originated in France and soon

spread to other parts of Europe and the Americas, thus affecting the whole world. The ideas of freedom, equality, democracy, and law advocated by the Enlightenment directly promoted revolutionary movements in Europe and the United States. It had particular influence on the American Revolution and similar independence movements across Europe. It can be said that without the Enlightenment, there would be no modern democracy.

As we all know, the victory of the Russian October Revolution in 1917 created the first socialist country in the world. After that, the socialist movement encompassed half of the world, and many countries established socialist regimes in succession; however, the victory of the October Revolution was not accidental. It was the result of long-term dissemination of socialist ideas and promotion of the workers' movement. These ideals can be traced back to the utopian socialism born in the sixteenth century. In the nineteenth century, Marx and Engels drew from the experience of the international workers' movement and analyzed the classic philosophy of Germany, the classical political economy of Britain, and the fantasies of France to form Marxist theory. The spread of Marxism was the prerequisite and foundation for the success of the socialist revolution.

Each ideological liberation movement will create a group of outstanding thinkers. The Renaissance movement produced Dante, Leonardo da Vinci, Michelangelo, Raphael, Shakespeare, and Cervantes. The Enlightenment movement produced Grotius, Hobbes, Locke, Montesquieu, Voltaire, and Rousseau. The communist movement produced Marx and Engels. It was the thoughts of these ideological giants that paved the way for historical development and subsequent social change.

Likewise, a series of outstanding political leaders will inevitably emerge during major turning points in history. For example, George Washington emerged out of the American Revolution, and Lenin came to prominence during the Russian socialist revolution. These politicians led their people to realize the ideals of the great thinkers and promote the development of history. The progress of history cannot be separated from great thinkers and politicians. Any reasonable and conscientious thinker or politician should bravely shoulder the heavy responsibility of history and never hesitate in the move forward.

The transformation from a country-based society to a unified society will be the most significant historical turning point in human society and will have unsurpassed impact on human society. No past change has ever targeted the fundamental makeup of human society or used universal happiness as the banner. The Renaissance aimed to overthrow feudal theocratic rule and free people to a certain extent; the Enlightenment sought to destroy the feudal monarchy and gain a limited amount of democracy and equality; and the communist movement's goal was to build socialist countries with proletariat dictatorships. All past social changes have been mainly aimed at wresting control from the ruling party and secondarily focused on gaining limited amounts of happiness for the people. In such processes, it was inevitable that only certain groups of mankind benefited while other groups were deprived.

The unified society will be a fundamentally different type of social change in two ways. First, its intent will be to protect all of humanity from extinction (it is also the only thing that will prevent human extinction) and to ensure as much universal happiness as possible. Second, unification will be for the sake of all mankind. No groups or individuals will need to sacrifice their interests for the interests of other groups or individuals.

Some people's interest will suffer to an extent during the unification process. For example, some people may lose their ruling powers and privileges, while others may experience slight decreases in living standards. However, they will obtain the survival of all humanity in exchange, not only for themselves, but for their future descendants as well. This gain will obviously be much more important than any lost interests.

The cause of global unification is a great cause that will benefit all humans. When this cause comes into conflict with localized interests, we must search for peaceful resolutions through the promotion of moral values.

To realize this goal, we must initiate a widespread ideological enlightenment movement that will awaken people to the importance of a unified society. This movement must change the established concepts of country and nationality so that people will willingly accept and happily welcome the arrival of a unified world.

The following aspects will be especially important during this enlightenment movement: people must replace the concept of national interests with the concept of universal human interests; they must replace the worship of science and technology with the awareness of its dangers; they must replace discrimination with universal equality; they must place universal survival above individual hedonism; and they must realize the maximum value potential of the unified society.

Though we are on the precipice of historical change, we cannot ask for all the masses to be rational; however, we can demand rationality from all conscientious politicians and thinkers. The greatest thinkers and politicians of our time must bravely lead the charge and pave the way towards the unified society. This is their sacred responsibility.

SECTION TWO: THE ROLE OF GIANTS

Great persons are those who contribute during the important turning points of history. The achievements of these great persons will be documented in history and known to the world. Great persons are not only equipped with personal talents and prowess, but also accompanied by major historical events. As the Chinese saying goes, "The time creates the hero."

Without World War II and the powerful machinations of Hitler, great leaders like Roosevelt, Stalin, and Churchill would not have come to prominence. These leaders passed difficult tests of life and death and led their people to victory despite terrible circumstances. As a result, they changed the course of history and left illustrious marks on its pages. What types of people can be called giants? From a literal perspective, it can be generally understood that giants must achieve

even more than great persons. There have been very few people who deserved the title of “giant” throughout history.

Among the most distinguished political commanders recognized in world history, there are some who are especially remarkable: Alexander the Great, Emperor Ashoka, Emperor Qin Shi Huang, Emperor Wu of Han, Julius Caesar, Muhammad, Genghis Khan, Peter the Great, George Washington, Vladimir Lenin, Franklin Roosevelt, Joseph Stalin, and Winston Churchill. These people are recognized because they have had a tremendous impact on history. The actions of these people can be roughly divided into the following categories:

1. Large-scale conquests and domination of unprecedented territory (Alexander the Great and Genghis Khan).

2. Effective administration and political, economic, and military systems reform; steady increase of national strength and successful large-scale foreign conquests and occupations (Julius Caesar and Peter the Great).

3. Unification of big nations (or ethnicities) or large lands with ground-breaking significance (Emperor Ashoka, Emperor Qin Shi Huang, and Muhammad).

4. Establishment of new national systems with far-reaching impacts on future generations (George Washington and Vladimir Lenin).

5. Defeat of mighty invaders and safeguard of national or world stability (Emperor Wu of Han, Franklin Roosevelt, Joseph Stalin, and Winston Churchill).

Analysis shows that, so far, the most outstanding political leaders in human history cannot escape these three major characteristics:

First, all of their achievements were centered around the interests of groups, such as countries, ethnicities, and religions. For example, in World War II, Roosevelt would not have sent troops if the interests of the United States had not been threatened. The never-ending conquests of Alexander and Genghis Khan were to build empires of unprecedented power; Washington and Lenin, on the other hand, wanted to establish countries with an ideal political system. Ashoka, Emperor Qin Shi Huang, Emperor Wu of Han, Caesar, Muhammad, and Peter the Great all fought for the interests of certain groups. In the end, the accomplishments and ambitions of these great leaders can all be attributed to the interests of groups.

Second, all of their efforts were centered around the theme of happiness. The prominent figures and political leaders in history who launched expansions and conquests did so to expand their spheres of dominance or satisfy their desires of subjugation. These were their pursuits of happiness. The leaders who led wars against invasion and established better political systems were all doing so to safeguard the happiness of their people.

Third, the achievements of these great leaders were all inseparable from war. This is partly related to the very nature of the country-based society. The conquering or protection of nations and the establishment of new political systems all require the motivation of war; thus, the accomplishments of all great leaders were built on massive casualties.

The transformation from a country-based society to a unified society will be a social reform on a never-before-attempted scale. It will require the combination of both historical giants and historical patterns.

What types of historical giants will emerge in the course of this transformation? Further analysis will show that this transition will be vastly different from all other historical transitions before.

First, all past historical revolutions have been centered on the interest of groups; the transition to a unified society will revolve around the interests of all mankind

Second, all past changes have been centered on the goal of happiness for a limited group of people; the transition to a unified society will focus on the survival of all humans.

Third, all past social reforms have been based on wars and violent killings; the transition to a unified society will be achieved through peaceful transi tion. Furthermore, though the unified society's original intent is to prevent human extinction, it is also the most ideal form of society that most complies with the maximum value principle. This makes the peaceful transition towards a unified society even more likely and just.

If great persons were born during past human history, giants will be born in the transition to a unified society. The superior significance of this unprecedented historical change cannot be described with mere words. Though the country is the highest form of power in our country-based society, not all national leaders have the power to influence the world. The leaders of the major powers will be strongest forces behind change. We have elaborated on this point before.

We know that the development of science and technology is only threatening humanity more as time passes. The sooner we can complete the transition to a unified society, the sooner we can alleviate the survival crisis of humanity. The objective conditions for global unity have already been satisfied; the time to act is now. We may not be able to rely on every person in the world to realize this on a rational level, but we can hope that the major leaders of this world will promote the best course of history.

This is a time for giants. The major leaders who shy away in such an important time will be the eternal sinners of history; those who step forward to assume the most important task of history will be immortalized in the memory of all future generations. For the continued survival of all mankind, for the happiness and peace of our future descendants, let us sound the historical call for giants!